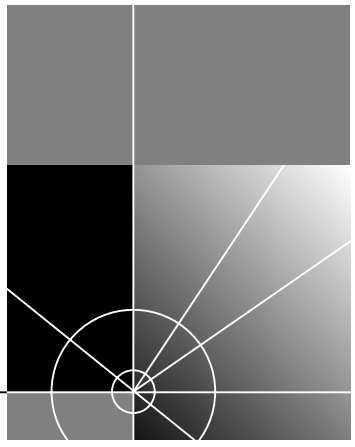
SuperStack II™ Switch 2000 TR User Guide

Version 4.0



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SWITCH 2000 TR

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RATION LIMITED WARRANTY

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HIS GUIDE

ovides the information you need to
nfigure the SuperStack II™ Switch 2000
0) into your Token Ring network for
nefit.

ntended for use by network administra-
le for installing and setting up network-
t. It assumes a basic working
f Local Area Networks and Token Ring in

information in the release notes shipped
ch 2000 TR differs from the information
follow the release notes.

How to Use This Guide

This table lists where specific information can be found.

Chapter	Information
1	Overview
2	Getting Started
3	Setting Up Management
4	Configuring with the VT100 Interface
5	Configuring with the LCD Console
6	Monitoring the Switch 2000 TR
7	Virtual LANs
Appendix	
A	Software Upgrade Utility
B	Screen Access Rights
C	Serial Port Cable Pin-outs
D	Troubleshooting
E	Technical Specifications
F	Technical Support

Conventions

The following tables list icon and text conventions that are used throughout this guide.

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escription

formation notes call attention to impor-
nt features or instructions.

autions contain directions that you must
llow to avoid immediate system damage
loss of data.

Warnings contain directions that you must
llow for your personal safety. Follow all
structions carefully.

ed for emphasis or to denote new terms.

nter" means to type something and then
urn or Enter key. Do not press the Return
when an instruction simply says "press."

`face` is used to represent displays that
our terminal screen; for example:

```
menu option
```

c keys are referred to in the text, they are
their labels, such as the "Return key" or
key," or they may be shown as [Return]

re keys are to be pressed simultaneously,
linked with a plus sign (+); for example:
Alt]+[Del].

Related Publications

Within the Switch 2000 TR document set:

- Switch 2000 TR Quick Reference Guide. (Part Number #99033)
- Switch 2000 TR User Guide. (Part Number #99032)
- Switch 2000 TR Release Notes. (Part Number #99034)
- SuperStack II Switch 2000 TR ATM OC-3 Module User Guide (Part Number #99041)
- SuperStack II Switch 2000 TR FDDI Module User Guide (Part Number #99048)
- SuperStack II Switch 2000 TR TR-in-FE Module User Guide (Part Number #99045)

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OVERVIEW

describes the major features, compo-
ncepts of the Switch 2000 TR, including:

SuperStack™ II Switch 2000 TR
of Features
plications of Token Ring Switching
Panel
anel
lide-In Modules
g Switching Concepts

About the SuperStack™ II Switch 2000 TR

The SuperStack II Switch 2000 TR is a multiport internetworking switch for Token Ring networks. Designed to satisfy the high demand for bandwidth in expanding Token Ring networks while preserving the investment in existing equipment, the Switch 2000 TR provides a natural migration path for network growth and high-speed technologies, including ATM and FDDI.

The Switch 2000 TR is a 12-port Token Ring stackable switch that supports throughput rates of more than 400,000 packets per second. Designed to fit comfortably within the data center or the workgroup environments, the Switch 2000 TR supports up to 72 rings per stack at 4 or 16 Mbps.

System Benefits

- **Network segmentation**—When used in place of low- performance PC bridges or routers, the Switch 2000 TR provides a simple method for segmenting Token Ring networks into smaller, more manageable workgroups.
- **Increased bandwidth**—A key benefit of segmentation is reduced traffic load, which translates into increased bandwidth and improved manageability.

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on—High density port population congestion and supports 4 and 16 es. In addition, the Switch 2000 TR m-configurable ports designed for ion or dedicated server connection.

nagement—Switch 2000 TR is sup- Transcend® Enterprise Manager r UNIX and Microsoft Windows work management applications pro- twork Management Protocol oring Management Information MON MIB) data using an intuitive face to report historical and perfor- s.

ontrol—The Congestion Control zes available buffer space in the R by using the buffering ability in all d stations. This is especially useful rts are transmitting to a common server connection. Having conges- minates the chances of dropped -traffic client-server environments.

n Slot—Optional downlink mod- le for the Switch 2000 TR. These de downlinks to high-speed back- FDDI, ATM, and Fast Ethernet.

odule supplies a 100 Mbps point of for multiple Token Ring switched nd supports either Single Attached S) or Dual Attached Stations (DAS).

- The ATM module supplies 155 Mbps UNI interface, and retains all virtual LAN emulation configuration data, provides ATM signaling, and offers standard LAN emulation.
- The TR-in-FE module combines Token Ring and Ethernet for the purpose of utilizing Fast Ethernet as a backbone and method of server attachment for Token Ring networks. Through a process known as ***tunneling*** or ***encapsulation***, TR-in-FE uses Fast Ethernet to transport natively formatted Token Ring frames.

- **High-speed Cascade Interface**—The high-speed cascade interface enables multiple Switch 2000 TRs to connect to form a single, large switched domain while reducing the cost typically incurred with FDDI or ATM functionality. This connection allows as many as six Switch 2000 TRs to be stacked.
- **VLAN Support**—The Switch 2000 TR supports virtual LAN (VLAN) operation by allowing any switch port to become a member of any one of 15 unique VLANs (workgroups). By establishing VLANs, LAN administration tasks such as adds, moves, and changes become easier while bulk downloads and configurations remain across workgroups. VLANs also enhance security and increase network efficiency by controlling traffic flow and containing broadcasts. VLANs are preserved over the High Speed Cascade Interface. In addition, industry-standard LAN emulation over ATM provides a method for creating enterprise-wide virtual LANs that reflect how networks actually function.

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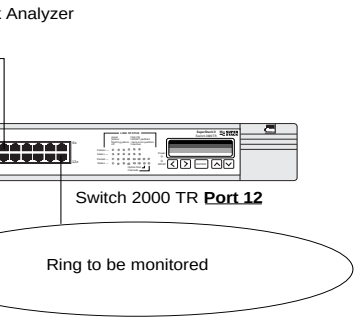
nalysis—The Roving Analysis Port (RAP) ows you to configure the SuperStack II 00 TR to capture and monitor traffic on Ring LAN connected to the switch using ry-standard LAN analyzer.

e operates on Port 1 of the Switch 2000 plies to all ports of the same switch. To c on other switches in a stack you must Port 1 of the appropriate switch and port you wish to view.



ysis

Summary of Features

- 12 switched shielded RJ-45 Token Ring ports
- 4 ports selectable for direct end station attachment
- High-speed cascade interface
- Front Panel LCD Console for fast configuration
- Flexible Option Slot for FDDI, ATM, or TR-in-FE expansion
- 400,000 packet-per-second aggregate forwarding rate
- Cut-Thru, Store-and-Forward, or Dynamic Cut-thru modes
  - Low latency in cut-through mode
  - No forwarded errors propagated in store-and-forward mode
  - Dynamic Cut-thru monitors error rates and selects Cut-thru or Store and Forward as appropriate
- Source route, transparent, and SRT bridging modes supported
- IBM and 802.1d Spanning Tree protocols supported with configurable BPDU addresses for additional flexibility
- Congestion Control
- SNMP network management support
  - Transcend® Enterprise Manager for HP OpenView, NetView/6000, SunNet Manager, Microsoft® Windows 95
- SmartAgent support

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IEW

P

IB

TR Private (3Com Private)

ack™ II architecture

Power System

able Power Supply

etwork management

DB-9 connector for local configura-

Typical Applications of Token Ring Switching

Token Ring switches are best suited for, although not limited to, expanding Token Ring networks. These networks demand high bandwidth, performance, monitoring, management, and a logical migration path for the continued growth of the network while preserving your investment in existing infrastructure.

Offering a significant advantage over traditional inter-networking equipment, Token Ring switches bring immediate relief to networks, solving throughput and management problems. By replacing low performance two-port PC bridges or routers, Token Ring switching provides the ability to perform Source Route bridging, transparent bridging, or both with Source Route Transparent (SRT) bridging. The following illustrations depict some possible uses of the Switch 2000 TR, including ring segmentation and migration to high-speed technologies.

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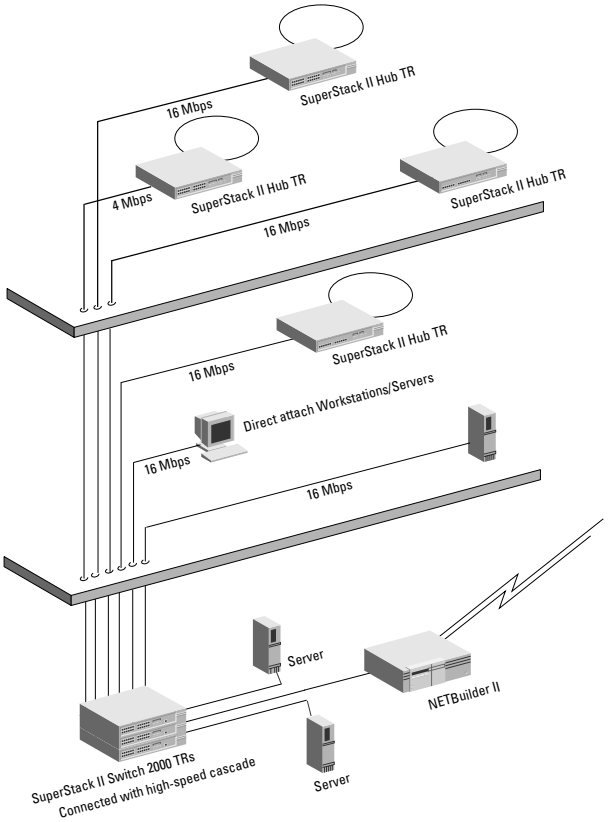
ion

witches offer a more efficient solution over 2-port PC bridges or routers. As illustrated below, segmentation Ring switch brings immediate improvement over existing networks by re-distributing traffic



h 2000 TR to Segment Network

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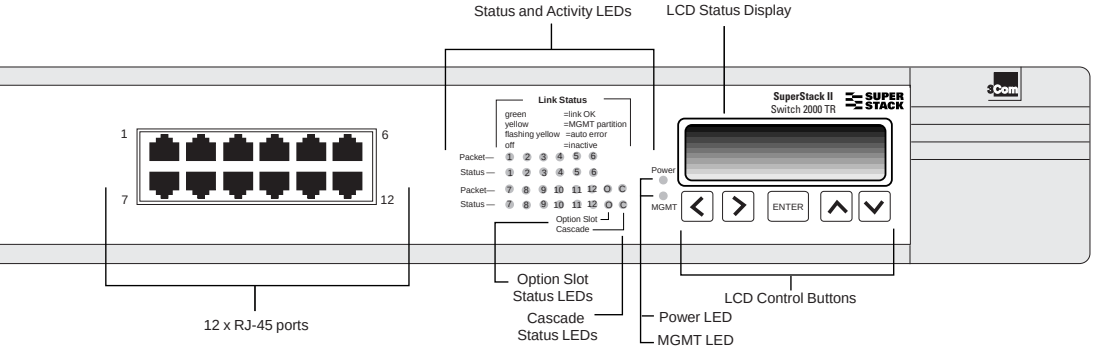
bes the front panel components and LEDs of the SuperStack II Switch 2000 TR. Figure 1-3 shows the front



tch 2000 TR Front Panel RJ-45 Ports

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s support unshielded Twisted Pair (UTP)
visted Pair cabling (STP) at 4 Mbps or 16
eed.

efault to adapter mode for connection
ng hub. Additionally, ports 1 through 4
ured to hub mode to allow direct
f workstations or servers.

he front panel of the Switch 2000 TR
rrent status of the switch. Use Table 1-2
e LED states.

s

or	Indicates
en	Traffic present
ning yel-	Error frames present
en	Port inserted
ow	Partitioned via management
ning yel-	Auto Error Partition
	Port not inserted
en	Presence of Option card
ning green	Activity on link
en	Cascade connection present

Table 1-1 LED States

LED Name	Color	Indicates
	Flashing green	Activity on link
Power	Green	Power ON
	Yellow	RPS w/alarm
MGMT	Off	Operation normal
	Flashing green	(slow) Software download
	Flashing green	(fast) Power On Self Test (POST)
	Yellow	POST has failed

LCD Display Buttons

Use the LCD display on the front panel of the Switch 2000 TR to select ports, change system parameters, receive status information, and set the Unit ID number.

- **Right and Left buttons**—Change or move digits or go to the previous menu.
- **Up and Down buttons**—Scroll up or down in specific menu and increase or decrease digit value.
- **Enter button**—Enter a menu or use to enter the edit mode.

Figure 1-4 LCD Display Buttons

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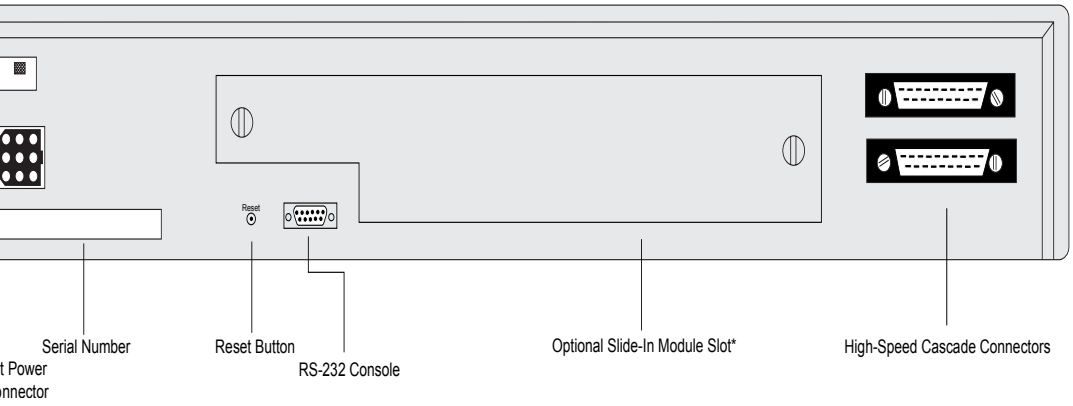
IEW

ibes the rear panel components of the Switch 2000 TR. Figure 1-5 shows the rear panel.



Rear Panel

riate module installation manual for more information.

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000 TR automatically adjusts to the
e. The fuse is suitable for both 110 AC
AC operation. Refer to "Replacing the
ter 2 for information on replacing fuses.

witch 2000 TR has no ON/OFF switch.

number if you need to report a fault.

System Connector

ector to attach a Redundant Power
to the Switch 2000 TR. Disconnect the
n using an RPS.

et button simulates a power on/off
n also perform a software reset using the
ce. Refer to "Setting Up the VT100
hapter 3.

32 console port for connecting a termi-
remote or local out-of-band manage-
figuration. Use the following settings to
VT100:

aud

y

it

Optional Slide-In Modules

Option modules provide alternate downlinks for the Switch 2000 TR.

***NOTE: Be** sure the filler plate cover is installed when the module slot is not occupied.*

Slide-in modules are available for the following:

The ATM Module

The SuperStack II Switch TR ATM OC-3 module provides a high-speed ATM connection between the Switch 2000 TR and ATM networks. When positioned in workgroup or departmental LANs, the ATM downlink module offers a 155 Mbps data path to building, campus or ATM network backbones directly from the Switch 2000 TR. Perfect for providing cost-effective ATM access to smaller isolated LANs or bandwidth intensive and mission critical applications, the ATM downlink also provides a logical migration path for existing Token Ring LANs to mainstream high-speed networking technologies.

Redundant links can protect your Switch 2000 TR from network failure or equipment inconsistencies. The built-in Software Upgrade feature allows you to download software revisions easily.

Benefits of an ATM

ATM is the only computer networking technology designed to carry video, voice and data traffic simultaneously. ATM provides the level of service necessary

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se bandwidth-intensive applications

fits of ATM include:

ased communications technology
es from T1 or ATM 25 to OC-3 (155
(622 Mbps), OC-48 (2.488 Gbps),
0 Gbps).

ices are easily added to existing

are designed for growth and pro-
ability.

LAN Emulation (LANE) technology
interoperability between existing
hernet, and ATM devices.

M Features

summarizes the features of the
ch 2000 TR ATM module.

TM Forum Standards

55 Mbps interface

3c) and SDH (STM-1) compliant

Fiber, SC connections

(LANE) version 1.0

d LAN Clients

Circuits

e MAC addresses

rk Interface (UNI) 3.1

Management Interface (ILMI)

- AAL5 ATM Adaptation Layer
- 16 Virtual LANs (VLANs)
- Data buffer to store 40,000 ATM cells
- Wire Rate Transmission on ATM port
- Low Latency (68 microseconds between ATM and Token Ring components).
- 3Com SmartAgent support, including:
  - SNMP management using 3Com's Transcend Enterprise Manager.
  - Telnet management using VT100 interface.

The FDDI Module

The SuperStack II Switch TR FDDI module provides a high-speed connection between the Switch 2000 TR and FDDI backbone networks. When positioned in workgroup or departmental LANs, the FDDI downlink module offers a 100 MB data path to building, campus or FDDI network backbones directly from the Switch 2000 TR. Perfect for providing cost-effective FDDI access to smaller isolated LANs or bandwidth intensive and mission critical applications. The FDDI downlink also provides a logical migration path for existing Token Ring LANs to mainstream networking technologies.

Redundant links can protect your Switch 2000 TR from network failure or equipment inconsistencies. The built-in Software Upgrade feature allows you to download software revisions easily.

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FDDI

ted Data Interface (FDDI) is a 100-Mbps
al area network standard supported by
mittee.

benefits of FDDI include:

ps point of aggregation for multiple
segments.

ingle Attached Station (SAS) or Dual
tation (DAS) functions.

erver connections via Token Ring FDDI
of IP, SNA, IPX, and NetBIOS.

services are easily added to existing
orks.

orks are designed for growth and pro-
scalability.

FDDI Module Features

list summarizes the features of the
Switch 2000 TR FDDI module.

to FDDI ANSI Standards

Transmission on FDDI port

cy.

artAgent support, including:

nanagement using 3Com's Transcend
se Manager.

nanagement using VT100 interface.

The Token Ring-in-Fast Ethernet (TR-in-FE) Module

TR-in-FE is a 3Com developed technology that encapsulates Token Ring frames in Fast Ethernet frames. Bridging the gap between Token Ring and Ethernet, this technology offers a more cost-effective integration than traditional bridging and routing, and allows Token Ring users to expand their bandwidth while preserving their TR infrastructure.

TR-in-FE is a unique way of combining Token Ring and Ethernet for the purpose of utilizing Fast Ethernet as a backbone and method of server attachment for TR networks. Through a process known as ***tunneling*** or ***encapsulation***, TR-in-FE uses Fast Ethernet to transport natively formatted Token Ring frames. This means that both source route and transparent TR frames addressing information is maintained through Fast Ethernet (FE) so that it may be interpreted and utilized by either a destination Token Ring (TR) switch or FE server.

Benefits of TR-in-FE

TR-in-FE offers improvement in the following areas:

- Scalability
  - TR switching
  - High-speed technologies
  - Wire-speed performance
- Flexibility
  - High-speed flexibility (choice of D/L technology)
  - Desktop flexibility (TR, Ethernet)

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nfigure and administer

th Token Ring and Ethernet to
st Ethernet physical wiring infra-
er base without impacting network
n-FE accomplishes this by introduc-
itional bridging via Source-Route to
ation.

latively well understood and easy to
nally, many tools exist to manage
st Ethernet due to its wide accep-
try and its similarity to Ethernet.

MIS managers most interested in:

ting investments in TR infrastructure

st, high-speed connectivity

ernet and Token Ring for common

s expensive than other options,
ATM. Using FE, the price per port
nent is 20% that of ATM and FDDI.

ing allows the install base of TR
configuration to remain intact and
allowing for an upgrade to higher
ugh microsegmentation and inter-
eed technologies. TR-in-FE repre-
or integrating Fast Ethernet into the
onment.

Summary of TR-in-FE Module Features

The following lists summarize the features of the SuperStack II Switch 2000 TR TR-in-FE module.

- Full duplex operation
- Automatic configuration through PCI registration
- RJ-45 connector for 100 Mbps data rates over category 5 UTP wiring up to 100 meters
- LEDs to indicate link integrity and link activity
- Promiscuous mode support for NDIS 3.0 and ODI32 drivers
- Compliance with FCC Class B, CISPR B, and CE
- Software configurable
- DOS diagnostics and configuration utility
- Support for frame sizes up to 3992 bytes

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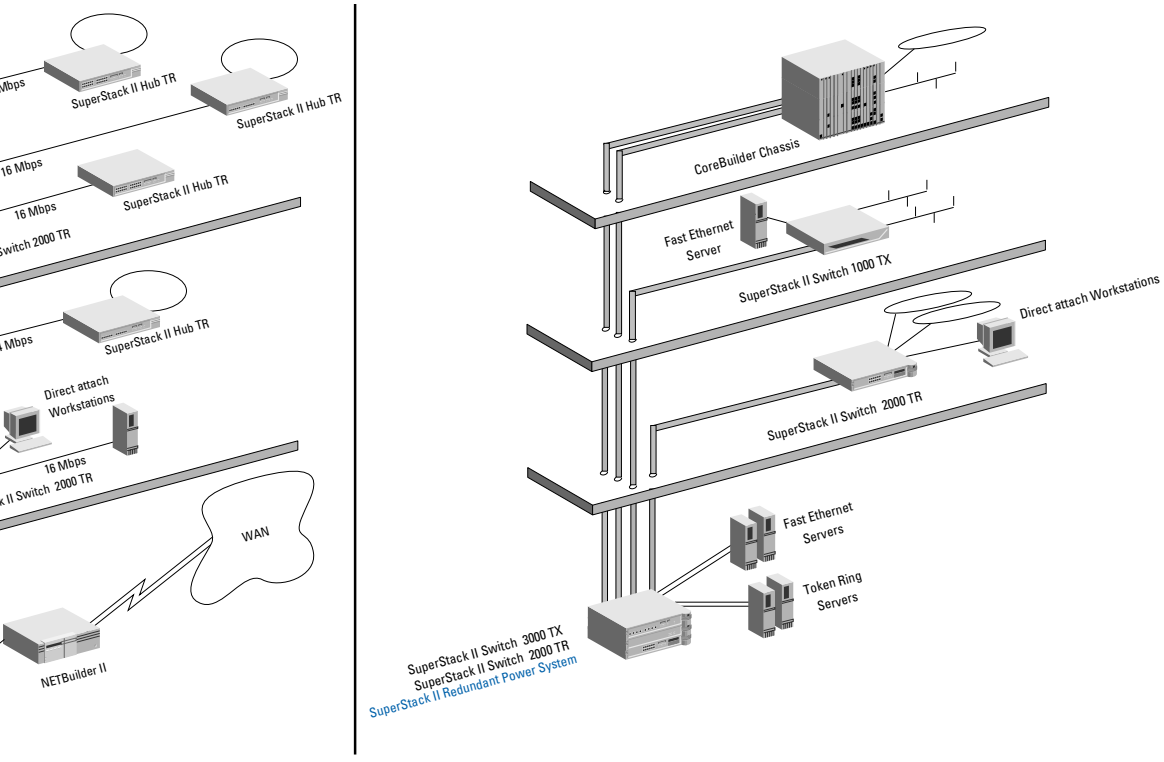
gh-speed Technologies

nt to migrate to FDDI, ATM, or TR-in-FE easily. Using Switch 2000 TRs, critical resources attach directly to echnologies while preserving the investment in Token Ring hardware. They also merge easily with existing net- ement applications. These features allow network managers to introduce additional switches, servers, and sta- sly via direct connections. Switch 2000 TRs can be contained in data centers while remaining connected to nks with single ATM, FDDI, or TR-in-FE module.



ng Switch 2000 TR for Migration to High-Speed Technologies

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onnectors

provide a high-speed cascade con-
Switch 2000 TRs in a stack. You can
units to form a single switched
connect up to six Switch 2000 TRs
ctors.

2000 TRs act as a single multiport
configuration parameters are
itches and the entire stack can be
wnloaded as a single IP entity.

ng Concepts

ibes Token Ring Switching and
f the Switch 2000 TR, including:

g Switching?
Bridging
dging
Transparent Bridging
(802.1d and IBM)
vard

hrough
ntrol

ching?

g networks are built around shared
and typically operate at 16 Mbps

wire speed. This 16 Mbps of bandwidth is shared between all stations on the ring. As applications become more sophisticated, or as work-stations become more powerful, or as the number of users per ring grows, the demand for bandwidth increases. As a result, stations are limited not by their own processing power but by the limitations of the physical network.

In an effort to reduce the traffic per ring and increase the overall bandwidth availability, existing rings have been divided into multiple smaller rings. This division provides more bandwidth per station.

With an optional FDDI or ATM downlink module, Token Ring switching also solves problems found in client-server applications where a shared 100 Mbps (FDDI) or 155 Mbps (ATM) pipeline can provide easy access to servers and WAN links.

The major benefits of Token Ring switching are:

- Bandwidth relief
- Migration path to high-speed technologies
- Cost-effective method for achieving LAN interconnectivity

Source Route Bridging (SRT)

Source Route Bridging is a method of allowing a ring station (node) on a Token Ring network to communicate with another ring station on a different ring interconnected by bridges. The "source" ring station, in other words, the node initiating the communication, is responsible for dynamically determining and then maintaining information about the "route" to

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n ring station. A route is simply the path
s through a source route bridged net-
e source ring station to the destination

ring environments, nodes on different
ditional bridging information before
municate with each other. A source ring
first determine if one or more routes
er station on a remote ring.

e source ring station determines the
ing a "discovery" packet out across the
work. Source routing bridges forward
y" packet while adding path informa-
, switches forward any response from
n ring station to the "discovery" packet
hen a source ring station receives a
dates its own bridging table with the
After determining the optimal path, the
nclude the path information in every
itted between them.

vides connectivity between LANs, form-
-wide networks. In a Token Ring envi-
rce routing switches connect Token Ring
ble peer-to-peer and terminal-to-host
ons across both local and wide area
etworks. Both PC workgroup protocols
tems Network Architecture (SNA) net-
pported by source routing switches.

ntage of switching is that it allows the
of the Token Ring network into multi-
educe traffic on any one particular ring
adjacent rings may be connected by

parallel source routing switches to provide fault tolerance. In the event one switch fails, the other parallel switch can be configured to automatically maintain connectivity, providing an alternate route for data between the two rings.

Transparent Bridging (TP)

Transparent bridging provides the simplest data communication method. In transparent bridging end stations are not aware of existing intermediate bridges. As such, a transparent bridge learns about its surrounding network from the source addresses of the packets that it receives. Forwarding decisions are based on the destination addresses contained in the MAC header. Transparent bridges consult their bridging table (see "Bridge Table) to determine which port should forward the traffic on to the destination port.

Bridge Table

A switch dynamically manages and updates its bridging table. All switches receive every packet transmitted on the segments attached to its ports. As a result, a switch is able to "learn" the source MAC addresses of each station that transmits packets on its attached segments. Since a switch never places its own MAC address in a packet that it forwards, the received source MAC address always identifies the original transmitter of the packet.

A switch uses the received source address information to construct its bridging table. The bridging table contains a list of all received MAC addresses and the ports on which they were learned. From its bridging

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ows which port must be used to
n MAC address.

h receives a packet, it examines its
determine if the source MAC
ed in its bridging table. If it is not, it
ry. The switch then searches its
the address contained in the
on address field. The switch then
ket to the port associated with the
address. If the port specified in the
he same port on which the packet
switch discards the packet.

tries in the switch's bridge table are
That means that if the switch does
ket from each entry before the
expires, the switches bridging table
This feature allows entries associ-
t stations to be removed from the
ble.

rent Bridging

ies, source route transparent (SRT)
oth source routing and transparent
he with routing information is
idge, the bridge performs source
kewise, if a frame without routing
eived at the switch, the switch per-
bridging.

pport is provided in the Switch 2000

- 802.1d Spanning Tree
- IBM Spanning Tree

802.1d Spanning Tree

Spanning Tree is an industry standard protocol (802.1d) which prevents redundant paths (loops) from existing within a network. By ensuring that only one active data path exists between any two rings, the Spanning Tree protocol prevents the following:

- Packet duplications
- Broadcast storms
- Packet misordering

In addition, Spanning Tree also provides fault tolerance within the network by automatically reconfiguring the active topology if a fault is detected in the network. This provides contingency paths in the event that the active path is disabled and guarantees stability.

IBM Spanning Tree

IBM Spanning Tree operates the same as 802.1d in that it resolves network loops. However, IBM Spanning Tree uses different addresses and parameters which do not interoperate with 802.1d Spanning Tree.

The IBM Spanning Tree algorithm reduces the number of broadcast frames in source routed networks. A single path is formed between networks from the root bridge. IBM Spanning Tree applies only to Spanning Tree Explorer frames (STEs). All Route Explorer frames (AREs), and Specifically Routed Frames (SRFs)

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ath in the network. ARE packets are
gh all bridges onto all rings. This creates
es if redundant paths exist in the net-

e requests are received at the destina-
e causes a response. Implementing
e ensures that the number of broadcast
gnificantly reduced.

rmation on Spanning Tree, refer to
ee Fields in Chapter 4.

ol

ontrol prevents loss of packets due to
n destination ports. You have a choice

trol—Flow control balances the band-
of the client ring to that of the server
s especially useful in focused load condi-
e many ports are sending data to a
.

ol monitors buffer usage and shifts the
the end station. This allows the Switch
o use the available bandwidth to access
y balancing traffic on the sending ports.

ing—Occasionally packets that are des-
particular port cannot be delivered. This
y true if a ring is busy or not operating.
kets inadvertently impede the delivery of
stined for known good or free rings.
ng provides a means for discarding pack-
n not be delivered while ensuring deliv-

ery of packets with known good or free destinations.

- **Off**—In Off mode there is no congestion control. Packet transfers are based on queue availability in the receive buffer. If there is no buffer space on the receiving port, packets are dropped.

Forwarding Modes

Switch 2000 TR provides three forwarding methods.

- **Store-and-Forward**—Switch 2000 TR can use a conventional store-and-forward method typically found in bridges. In this mode, packets are received and buffered (stored) in their entirety before they are forwarded. This guarantees that errored frames on the source ring are not forwarded to the destination. Although store-and-forward guarantees packet stability, it also involves a transit delay depending on the length of the packet.
- **Cut-thru**—Cut-thru avoids the transit delay found in standard store-and-forward methods. Although cut-through can be applied only between ports that are operating at the same wire speed or from a high speed port to a low speed port, it does provide better transit rates by forwarding a frame as soon as enough information is available to determine the destination port.
- **Dynamic Cut-thru**—In Dynamic Cut-thru mode the switch monitors error rates on the source. If a user set threshold is exceeded, the switch port changes to store and forward mode until the error rate reduces. At this point the port reverts to

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. The default mode for the Switch
amic Cut-thru.

d as a group of location- and topol-
devices that communicate as
on the same physical LAN. This
re not restricted by the hardware
nects them, and segments are
user groups created by the user.
VLANS, the user can define a net-
:

ups—A VLAN could be created for
partment, another VLAN for the
nt, and still another for the Devel-
ent.

ups—A VLAN could be created for
for managers, and still another for

A VLAN could be created for Email
multimedia users, and so on.

VLAN

d shared media support VLANs. In
enting VLANs:

ge of devices

roadcast traffic

security

VLANs facilitate the administration of logical groups of stations that can communicate as though they were on the same LAN. VLANs also facilitate moves, adds, and changes of members of logical groups.

Traffic between VLANs is ***firewalled***. This limits the propagation of multicast and broadcast traffic between VLANs.

Each distinct VLAN is uniquely identified throughout the bridged LAN. A consistent representation of a VLAN exists across a VLAN fabric (including ATM). This means that the shared VLAN knowledge of a particular packet remains the same as the packet travels from one point to another.

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GETTING STARTED

describes the installation and setup pro-
he Switch 2000 TR:

Safety Information

g the Switch 2000 TR

he Slide-in Modules

he Switch 2000 TR

g Redundant Power System

g to the Serial Port

aults

Important Safety Information

NOTE: *Warnings contain directions that you must follow for your personal safety. Follow all instructions carefully. Please read the following safety information before installing the Switch 2000 TR.*

- Installation or removal of any add-in module or cable must be performed by qualified personnel only.
- The Switch 2000 TR must be attached to a grounded power source.
- The power cord must comply with the standards of the country in which the Switch 2000 TR is to be installed.
- For USA and Canada:
  - The cord must be UL-approved and CSA certified.
  - The minimum specifications for the flexible cord:

    No. 18 AWG

    Type SV or SJ

    3-conductor
  - The cord must have a rated current capacity of at least 10 Amps.

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pply plug is unsuitable and you
, refer to the following specifica-

to the Live (Line) plug terminal. The
y be marked with the letter L or col-

the Neutral plug terminal. The ter-
e marked with the letter N or col-

n wire to the Ground (earth) plug
ich may be marked with the letter
rth symbol or colored yellow/green.

00 TR operates under SELV condi-
xtra Low Voltage) according to IEC
lard is complied with only when the
ed to equipment following the same

of the same type and manufacture
n 2000 TR.

remove the cover. The Switch 2000
er-serviceable parts.

remove an Optional Slide-in
e without disconnecting the power

Positioning the Switch 2000 TR

The Switch 2000 TR is suited for data center and workgroup applications. It can be mounted in a standard 19-inch rack, on a wall, or free-standing on a table or similar surface. A mounting kit with two brackets is provided for wall or rack mounting.

Considerations for Placement

Be aware of the following considerations when installing the Switch 2000 TR:

- Can cable lengths and media be supported properly?
- Is cabling located away from sources of electrical noise such as radios, transmitters and other radio frequency equipment?
- Are all objects removed from the top of the unit or stack?
- Is air flow adequate through the side vents?
- Is unit installed in moisture and water-proof environment?

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delines

ology rules for Token Ring are shown

	4 Mbps	16 Mbps
P	660 ft/200m	330 ft/100m
UTP	1,320 ft/400m	660 ft/200m
	2,000 ft/600m	1,000 ft/300m

Fuse

000 TR automatically adjusts to the sup-
The fuse is suitable for either 90-110V
40V A.C. A spare fuse is provided in the

e

e 2-1 for the location of the fuse. When
lace the Switch 2000 TR fuse with a
the following specifications:

— 4A Slo-Blo

the Switch 2000 TR by removing the AC
r the Redundant Power System cords.

en the fuse holder cover with a small
ewdriver.

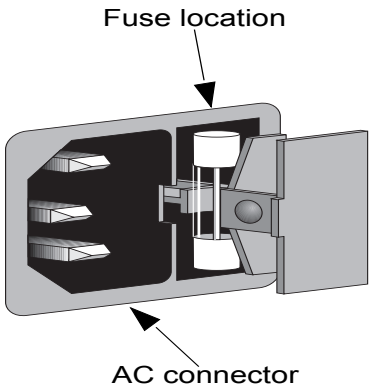

Figure 2-1 Switch 2000 TR Fuse Location

3 Slide out the fuse holder drawer and remove the fuse.

4 Install the replacement fuse and close the fuse drawer.

5 Re-insert the power cord and apply power.

Installing the Slide-in Modules

This section explains how to install the three optional modules into a SuperStack II Switch 2000 TR device. The modules are:

- ATM
- FDDI
- TR-in-FE

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s follow Electrostatic Discharge when installing an I/O Module.

nnected to the network, turn off the nect the switch from the main the network.

on a flat, clean, hard, work surface.

e the blanking plate that covers the 2. Retain the blanking plate and the use.

s within the Switch slot to align the tion of the guide rails and the cor- f the plate is shown in Figure 2-2.

into the slot without touching the the circuit board, which positions he plate. Ensure that the module is the unit.

rews attached to the module to fix into place.

e to the module port.

pecifications see the guide that nodule.

able has a transmit (Tx) and receive onnect the Rx connector to the Connect the Tx connector to the Do the same at the other end of the

tch. The link status LED turns green ection is made.

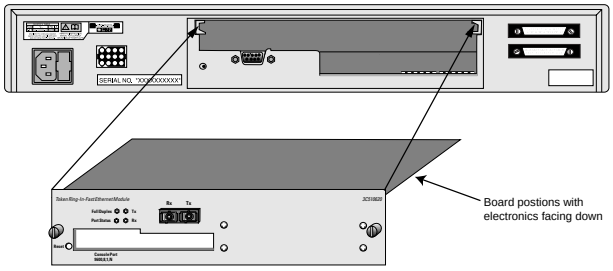

Figure 2-2 Inserting a Slide-in Module into a Switch 2000 TR

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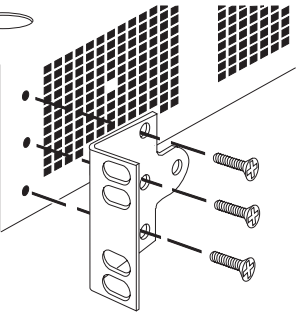
vitch 2000 TR

000 TR fits a standard 19-inch data com-
ack typically found in wiring closets.

witch 2000 TR and place it on a hard,

of the enclosed mounting brackets over
holes and attach. See Figure 2-3.



ing the Switch 2000 TR

ocess for the second bracket.

tch 2000 TR in the rack and secure it
screws (not included). Be sure to allow
ventilation.

000 TR can be mounted to a wall with
brackets. Be sure that the wall is suitable for mounting the unit. A flat, smooth surface that is dry and sturdy is best.

1. Unpack the Switch 2000 TR and place on a hard, flat surface.
2. Position one of the enclosed mounting brackets over the mounting holes and attach. See Figure 2-4.

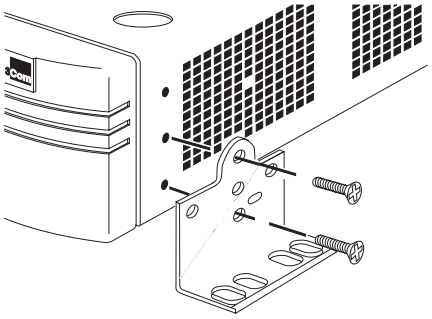


Figure 2-4 Wall Mounting the Switch 2000 TR

3. Repeat the process for the second bracket.
4. Mount the Switch 2000 TR to the wall. Be sure to allow for adequate ventilation.

Stack Mounting

The Switch 2000 TR can be stacked with other components of the SuperStack system using the four enclosed self-adhesive rubber pads. Apply the rubber adhesive pads to the underside of the unit. Stack the units, ensuring that the pads of the upper unit sit in the recesses in the cover of the lower unit.

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dant Power System

proceed as follows:

isconnecting the AC power cord on
TR.

able assembly to the RPS connector
l of the Switch 2000 TR.

r end of the RPS cable assembly to
r on the back panel of the RPS unit.

Serial Port

TR serial port settings are set to:

—8

00

ed to the Switch 2000 TR must be
se same settings before you can

e serial port can be direct for local
hrough a modem for remote man-

tion on the serial port console, refer
e VT100 Console in Chapter 3.

Connecting a VT100 Terminal

To connect a VT100 terminal directly to the serial port on the Switch 2000 TR you need a standard null modem cable. Follow these steps:

1. Connect one end of the cable to the serial port on the Switch 2000 TR and the other end to the serial port on the VT100 terminal.
2. Ensure that your terminal is configured to the appropriate settings listed above.

Device Defaults

The tables list the factory defaults for the Switch 2000 TR.

Table 2-1 Unit Defaults

Unit ID	#6

CAUTION: *Setting the Unit # ensures that all configuration parameters are retained when connecting additional switches. Change this number to reflect position of switch in stack. The first (bottom) switch should be set to 1.*

Table 2-2 Port Defaults

Admin State	Enabled
Workgroup ID	Unit 1
Personality	Ports 1 through 12 adapter
Internal Priority	Normal
Congestion Control	Non-blocking
Token Priority	Normal

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	16 Mbps
Mode	Cut-through
-thru	
	20%
	10%
orm old	60%
hold	50%
	none
n	none
efaults	
	100
	62
N ID	FFFF (hex)
esc.	8
	Auto-Span

ck Defaults

	Enable

kgroup Defaults

ame	WGroup Created (single)

lge Defaults

rts	12
	SRT
s	C0-00-00-00-01-00

Spanning Tree Support	Disabled
Spanning Tree Parameters:	802.1d
Priority	32768
Max Age	20 seconds
Hello Time	200 seconds
Forward Delay	15 seconds
Transparent Parameter:	
Entry Age	300 seconds

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SETTING UP FOR MANAGEMENT

describes background information for
and the procedures for initial setup of
k II Switch 2000 TR, including:

00 TR Management Options

g Switch 2000 TR in Stack

over the Network

ent Prerequisites

00 TR Management Consoles

the VT100 Console

the LCD Console

BOOTP

ut

Software

he Switch 2000 TR

required for setup is assigning a Unit ID
h you configure with the LCD Console.
nagement Prerequisites, Setting Unit ID"
ns on assigning the Unit ID. You have
for the initial setup—VT100 or LCD
n the switch has been configured for
, you assign the remainder of the
s described in Chapters 4 and 5.

Switch 2000 TR Management Options

You manage the Switch 2000 TR using one of the following communication methods:

- Use an SNMP network manager such as Transcend® Enterprise Manager over a network running IP protocols. Each network manager application provides its own user interface.
- Use the VT100 interface for out-of-band communications by connecting a VT100 terminal (or workstation with terminal emulation software) to the serial port of the Switch 2000 TR.
- Use the VT100 interface over a TCP/IP network for in-band communications using a workstation running a VT100 terminal emulation program and Telnet.
- Use the front panel liquid crystal display (LCD) and associated buttons.

These communications methods are summarized in the following table and explained in detail in following sections.

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000 TR Management Options

lows you to. . .	Using . . .
ablish an t-of-band connec- n to the VT100 con- e.	VT100 Console
ablish in-band nnection to the 100 console	Telnet on TCP/IP protocol stack
anage devices using MP network man- ement application	SNMP on TCP/IP protocol stack
t basic parameter, w port status, and Unit ID	Front panel display

nterface

interface for the Switch 2000 TR is
00 interface or Local Management
simple series of menus, the VT100
access to switch functions, includ-
it, bridge, switch, and workgroup
tics; communication parameters,
for individual users. Refer to "The
or more information.

00 management communications
000 TR via the serial port or an IP
on as explained next.

gement interface via a VT100 termi-
0 terminal emulation software. You
tly to the Switch 2000 TR using the

serial port or via a modem connection. This method is especially useful for initial setup and configuration or if the device is not reachable via network management applications.

This method allows you to manage the Switch 2000 TR when:

- You configure and initialize the system.
- The LAN is unable to provide reliable service.
- The network manager does not have direct LAN connection.
- The network manager software does not support SNMP.

When a connection has been established, the main Switch 2000 TR banner appears and you can log on.

Via an IP Network Connection

Access the management interface via a Telnet utility over a network running TCP/IP. The console interface is the same as that of the interface for the serial port. The Telnet application requires a VT100 terminal emulation application interface.

Before you can start a Telnet session, you must set up the IP parameters. To open a Telnet session, you must specify the IP address of the device you want to manage. Up to three Telnet sessions can exist simultaneously.

When a connection has been established, the main Switch 2000 TR banner appears and you can log on.

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itch 2000 TR in Stack

nique characteristics of the Switch 2000
to be part of a stack. When installed as
stack, up to 6 Switch 2000 TRs form
t of a switching chassis, managed using
ddress. All traffic, management, moni-
onfiguration tasks and inquiries operate
igh-speed cascade interface located at
ch unit. See Figure 3-1.

rules for the Switch 2000 TR are sim-

unit must have the lowest Unit ID
the stack.

unit should be at the bottom of the

mended that each consecutive unit have
Unit IDs.

redundancy each consecutive unit
e the same IP address setting as the

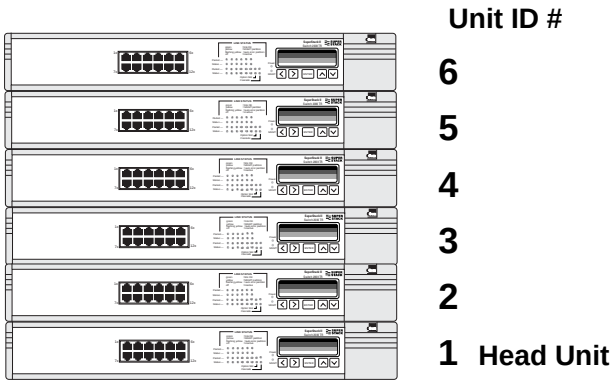

Figure 3-1 Switch 2000 TR in stack setting.

Cascade Connections

Cascade connectors must attach from the top connector of bottom unit to the bottom connector of next highest unit, up through the stack. See Figure 3-2.

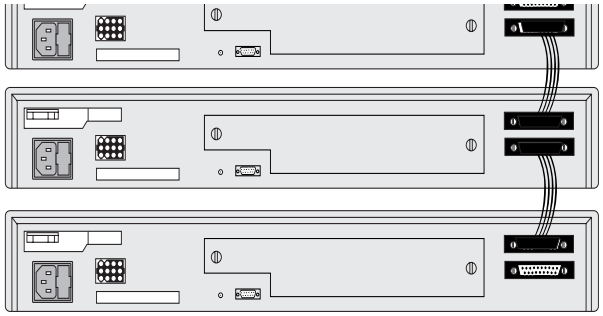

Figure 3-2 Switch 2000 TR Cascade Connections

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Network

ager application running Simple
ment Protocol (SNMP) can manage
R, provided the Management Infor-
) is installed correctly on the man-
SNMP files for all 3Com products
e "3Com Bulletin Board Service" in

ment applications provide their own
he management facilities. 3Com's
of network managers, for instance,
es for managing the Switch 2000
00 TR supports SNMP over TCP/IP

IP) addresses are designed using
tation, such as n.n.n.n, where n is a
0 and 255.

ss is 192.128.40.120.

two parts:

f the address (192.128.40 in the
ifies the network on which the
Network addresses are assigned by
rganizations. Each set of network
que within the context of the Inter-

t of the address (.120 in the exam-
he device within the network.

Assigning unique device addresses is the responsibility of your network organization.

Operating IP in a Closed Network

If you are the manager of a network that has no connection to the outside world, you might not need uniquely assigned network addresses. If you are using the IP protocol for internal management of your network, you can assign arbitrary addresses, provided each device is unique.

If you decide to use the IP protocol internally we suggest using addresses in the 192.100.X.Y, series where X and Y are numbers between 1 and 254.

If you later connect to the outside world, you will have to re-assign new, valid network numbers assigned to your network by the NIC or other international organization. Refer to "Obtaining Network Addresses".

A subnet address is a filtering system for IP addresses. We suggest using a general mask such as 255.255.255.0 if you are unsure what mask to use.

Obtaining Network Addresses

Contact one of the following organizations to obtain a valid set of network addresses.

- **In the United States**

  InterNIC Registration Services
  505 Huntmar Park Drive
  Herndon, VA 22070
  Telephone number:

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-4345, 1-619-455-4600, 1-703-742-4777

409
l
n
rlands
number:
2 5065

cific

Network Information Center (APNIC-DOM)
uter Center, University of Tokyo
yoi
, Tokyo 113

number:
0 3782

Management Prerequisites

Before you can successfully operate and manage the Switch 2000 TR you must assign a Unit ID number to the device. This section describes the necessary steps for assigning a Unit ID#.

The only method for assigning a Unit number is via the LCD Console located on the front panel of the Switch 2000 TR.

Locate the LCD Console and proceed as follows:

1. Power on the Switch 2000 TR.

   Switch 2000 TR>Unit ID 6 appears in the LCD Console. This is the factory default.

2. Press [Enter] to enter the working menu of the LCD Console.

   Switch 2000 TR>Unit appears.

3. Press [Enter].

   UNIT>Unit # appears.

4. Press [Enter].

   Unit #>6 appears.

5. Press the [Down Arrow] once. The number 1 appears.
6. Press [Enter]. The Unit ID number has now been set.
7. Press [Left Arrow] twice to return to the main LCD Console menu.

Continue with the management setup as described in the remainder of this chapter.

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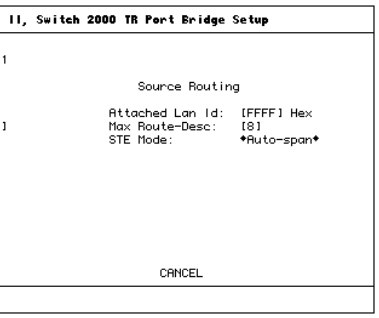
quisites

rate the Switch 2000 TR in a source ent, you need to assign a segment ructions below, from the Port Setup

n the bottom of the Port Setup

etup screen appears.



o Screen (Attached LAN ID Setting)

ed LAN ID under the Source Routing ght side of the screen.

N ID is set to FFFF which is the r "not assigned."

n value to this field to perform efer to "Setting Source Route Bridg- or more information.

Switch 2000 TR Management Consoles

The following sections describe how to get started managing your Switch 2000 TR. If you plan to manage the Switch 2000 TR using IP or SNMP, you will have to assign an IP address to the Switch 2000 TR using one of these interfaces:

- VT100 Console Interface. See Chapter 4.
- LCD Console Interface. See Chapter 5.
- BootP may also be used to assign IP address. Refer to "Setting Up BOOTP".

The VT100 Console

This section describes the screen conventions used in the Switch 2000 TR VT100 console interface. The VT100 interface allows you to set and/or view these switch parameters:

- IP and associated addresses and management
- Port personality, speed, and state
- Bridge type, bridge number and Spanning Tree state
- Switch 2000 TR status and hardware and software version numbers

Choice Field

Example display:

```
*text*
```

Text enclosed with asterisks is a list from which you can select one option. Press [Space] to cycle through the options. When your choice is highlighted press

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] or [Return] to move to the next field.
tch 2000 TR VT100 Console Interface

ay:

in square brackets on the screen indi-
ntry field. This field may be text, numeric
decimal data.

ds are hidden, meaning the text you type
on the screen.

s an Entry field has a default entry. To
efault value, simply type in a new value
nd the default entry will be erased.
Arrow] or [Return] to move on to the

ay:

n is always shown in uppercase letters.
out actions. For example OK: or CAN-
a button, move the cursor to the
ress [Return].

ay:

ager, or security

A list box allows you to select one or more items from a list. These keys allow you to select from a list:

- **[Return]**—moves the cursor to the next field. Carries out a button's action.
- **[Space Bar]—**moves through a text list for a field. Use it to highlight the item or value you want.
- **[Down Arrow]**—moves down a list item by item and starts over again at the top.
- **[Ctrl] + [U]**—moves the cursor one screen up the list box.
- **[Ctrl] + [D]**—moves the cursor one page down the list box.

Key Board Shortcuts

Here are some shortcuts you can use to navigate within the console screens:

- **[Tab]**—Moves from one field on a form to the next on any screen without making a change.
- **[Return]**—Moves you to the next form field after you have made an entry.
- **[Left Arrow]**—Moves you to the previous field on the screen or the ***previous*** character in an editable field.
- **[Right Arrow]**—Moves you to the next field on the screen or the ***next*** character in an editable field.
- **[Ctrl] + [R]**—Refreshes the screen.
- **[Ctrl] + [B]**—Moves the cursor to the next button.
- **[Ctrl] + [P]**—Returns to the previous screen.

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Moves to the next screen after imple-
nt screen settings.

Displays list of key strokes.

s

VT100 terminal or [Backspace] on a
es the cursor one space to the left
racter. To delete more than one
he key once for each character.

efully before using the Control keys.
elnet or a terminal emulation pro-
d that some Control keys do not
that they control other functions.
mentation that accompanies your
emulation software.

r types are allowed by the resident
sole. They cannot be deleted or
work administrator. Refer to
ult names and passwords. Refer to
listing of Screen Access Rights.

es and Passwords

Password	Access Level
nonitor	monitor
manager	manager
ecurity	security

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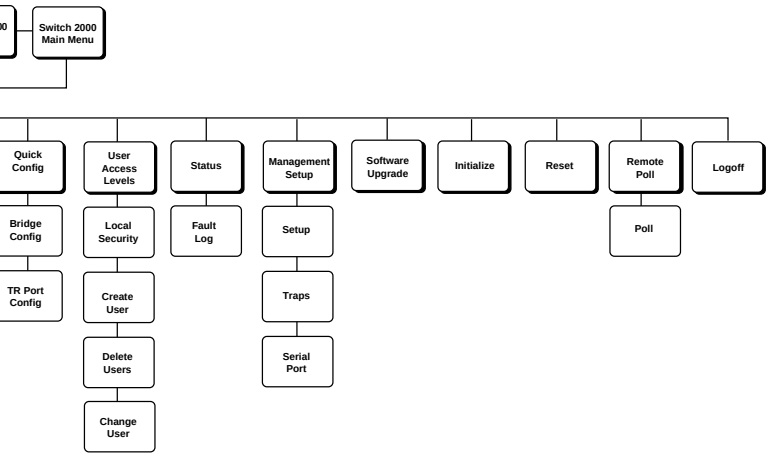
Menu Map

plays the menu structure for the Switch 2000 TR VT100 console interface.



itch 2000 TR VT100 Console Interface Menu Map

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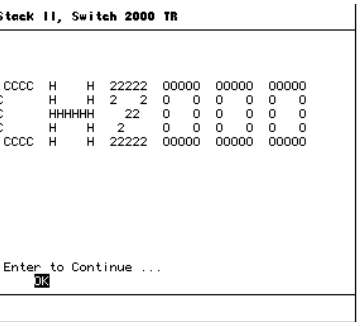
00 Console

des instructions for setting up the
r local or remote management.

-compatible terminal to the serial
2000 TR. Configure the terminal to
ings:

e or more times until the Switch
r appears. See Figure 3-5.



*ot modify these settings. If your ter-
et up with these values, the Main
s soon as power-up completes.*

he Main Banner.

4 Log on using the default name ***security*** and password ***security***. See Figure 3-6.

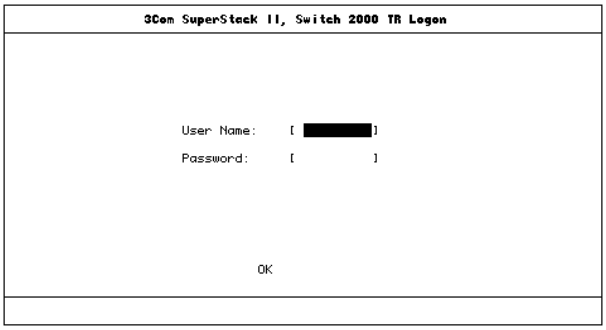


Figure 3-6 Logon Screen

5 Select OK. The Main Menu appears. See Figure 3-7.

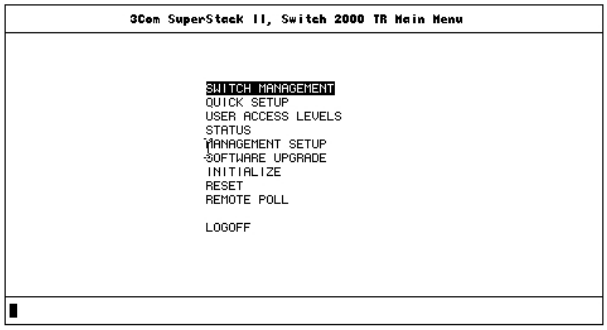


Figure 3-7 Main Menu

6 Select the Management Setup option.

The 3Com Switch 2000 TR Management Setup screen appears. See "Switch 2000 TR Management Setup Fields".

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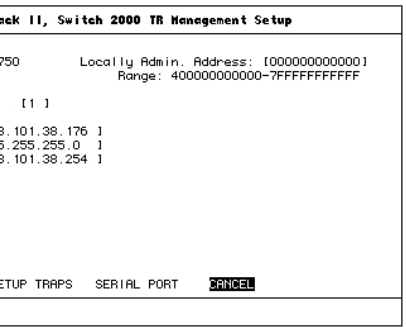

) TR Management Setup Screen

owing fields:

Address

onet Mask (if applicable)

uter (if applicable)

en you have finished Management
ill be asked to confirm your settings.

Settings are confirmed.

witch 2000 TR by returning to the main
ecting RESET. See "Resetting the Switch
page 3-18.

ready to communicate with the Switch
g IP and an SNMP-based management

Switch 2000 TR Management Setup Fields

MAC Address

Displays the Switch 2000 TR unit MAC address.

Locally Admin Address

Use this field to assign locally administered addresses to the management port. You need to reset the Switch 2000 TR for the address to take effect. The Locally Administered Address field allows you to assign a unique MAC address to the unit. This feature is useful for identifying specific units by their addresses.

To set a Locally Administered Address, take these steps.

1. Enter address in hexadecimal from the Locally Admin. field. This must be in the range of 400000 000000 to 7FFFFF FFFFFF.
2. Select OK.
3. Reset the Switch 2000 TR.

NOTE: *The Locally Administered address will not be valid unless the Switch 2000 TR is reset. Refer to "Resetting the Switch 2000 TR" for instructions on resetting.*

To reverse the Locally Administered address and revert to the resident MAC address you must enter all zeros and reset the Switch 2000 TR.

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umber for purposes of manage-
nt is only part of a single work-
be viewed as a sub-net. If you
gement setup to a new or different
eed to change the workgroup ID.

ss

unique address to the device in this
the IP address using this field.

Mask

suitable network mask to the
. For a class B address, 255.255.0.0
ange the Device SubNet Mask using

ss of the router with which the
ommunicates. You can change the
address using this field.

IP address parameters and Work
be valid unless the Switch 2000 TR

to display the setup screen for
eters. Refer to Chapter 4.

to display the setup screen for serial
Refer to Chapter 4.

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e

escribes the LCD Console. The LCD
vs you to enter specific configuration
nd obtain status data on the Switch
out using a management workstation
plication.

n 2000 TR
. 1

ENTER

TR LCD Console

ight, up, down, and enter buttons to
dit, or delete configuration parameters.

ociated addresses and management
nality, speed, state
e and Spanning Tree state
tus; hardware and software versions

ons

ENTER

on to accept or change data on any field
er down in LCD menu.

Left Arrow

Use the left arrow to go to the previous menu.

Right Arrow

Use the right arrow to move to a specific digit on any data field line.

Up Arrow

Use the up arrow to scroll up in a specific menu or to decrease the value of a highlighted digit.

Down Arrow

Use the down arrow to scroll down in a specific menu or to increase the value of a highlighted digit.

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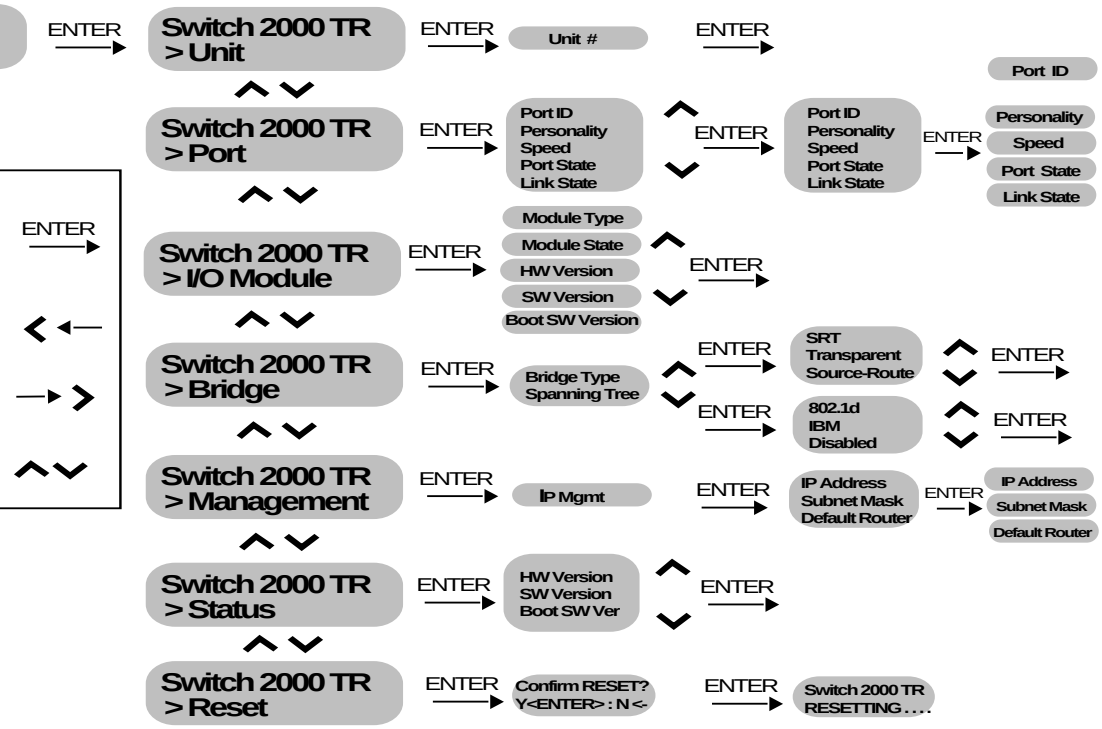
Map

ys the menu structure for the LCD console interface on the front panel of the Switch 2000 TR.



LCD Console Menu Map

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LCD Console

rovides instructions for setting up the for local or remote management.

er] button on the front panel LCD to n menu.

2000 TR
1

TER

l LCD Main Banner

Arrow] until the **Switch 2000 TR >Man-**
een appears.

o enter the management menu and ired management type.

ou can choose IP.

se IP, you need to assign an IP address, sk and default router in order to com- with the Switch 2000 TR. Refer to "IP etup" on.

nagement>IP Mgmt screen, proceed

o select IP address field.

>IP Address screen appears.

A blank decimal notation appears on the IP Address.

3 Enter IP address as follows:

- Select the value of the digit by moving the [Up or Down Arrow] until the desired value appears. Choose from 0 through 9 and ".".
- Select the next digit by moving the [Right Arrow].

NOTE: *Be sure to use standard dotted decimal notation for the IP address.*

4 Press [Enter] to accept the address.

If the address is valid, you return to the previous menu by pressing [Enter]. If the address is invalid an error message displays and returns you to the previous menu when you press [Enter].

5 Press [Down Arrow].

The **IP Mgmt >Subnet Mask** screen appears.

6 Press [Enter].

A blank decimal notation appears in the Subnet Mask field.

7 Enter the Subnet Mask address as follows:

- Select the value of the digit by moving the [Up or Down Arrow] until the desired value appears. Choose from 0 through 9 and ".".
- Select the first digit by moving the [Right Arrow].

8 Press [Enter] to accept the address.

9 Press [Down Arrow].

The **IP Mgmt >Default Router** screen appears.

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otation appears in the Default

Router address as follows:

e of the digit by moving the
rrow] until the desired value
se from 0 through 9 and ".".

ed digit by moving the [Right

cept the address.

to return to the higher level screens
e.

Switch 2000 TR for any address set-
t. Refer to "Resetting the Switch
uctions.

y to communicate with the Switch
and an SNMP-based management
to Chapter 5 for more information
e bridge, port, and other manage-

Setting Up BOOTP

The BOOTP option allows you to enable or disable the bootstrap protocol. The BOOTP (bootstrap protocol) allows the switch to discover and learn its own IP address and routing table information. To configure a Switch 2000 TR with the BOOTP option you will need a BOOTP server program. The MAC address, recorded on a label on the rear panel of the Switch 2000 TR, must be entered in the BOOTP server program along with the corresponding IP address of the Switch 2000 TR and its default route information. This allows the BOOTP request from the agent to be logged by the BOOTP server which then supplies the required IP information.

Table 3-3

BOOTP State	IP Address Configured	BOOTP Requests. . .
Enabled (default)	No	Sent continuously (approx. every 512 secs.) until address is discovered
Enabled	Yes	Not sent, IP address is known
Disabled	Yes/No	Not sent

Follow the instructions below to set the BootP communications parameters.

1. Log on to the Switch 2000 TR.
2. Select Switch Management from the main menu.
3. Select *Stack*
4. Select Setup.

The Stack Setup screen appears. See Figure 3-12.

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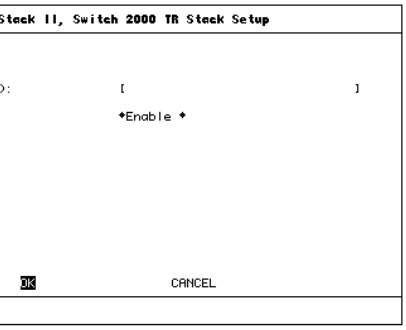

p Screen (BootP Setup)

er a sysname for the stack.

pace Bar] to Enable or Disable BootP.

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TR has a built-in auto logout feature
e VT100 interface after approxi-
utes without keyboard activity. This
level of security for network man-

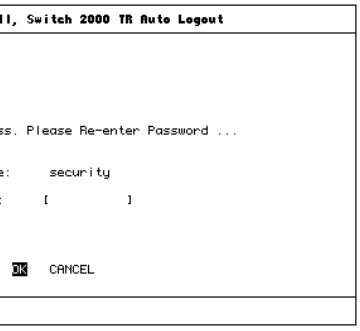
Logout screen proceed as follows:

ely three minutes without keyboard
VT100 screen the following message
ttom of the screen:

ty timer expiring within 10 sec-
above warning is posted the follow-
ears:

xpired."

screen appears. See Figure 3-13.



Auto Logout Screen

ord.

4 Press [Enter].

You return to the screen you were viewing before the inactivity timer expired. Refer to Table 3-2 for passwords.

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ware

Upgrade feature allows you to down-
tware images using TFTP running over

Corporation issues a new version of the
ge for the Switch 2000 TR, you can
the 3Com Bulletin Board Service. See
tin Board Service in Appendix F.

nload a version of the software image
unit in a stack. In most cases this unit
ad unit. The file name "Unit # n" (see
e field in Figure 3-14) is reserved for
where "n" specifies the ID of the unit
e download occurs.

download procedure assumes that you
an one switch in your stack and that the
ceeds from the head unit:

ch 2000 TR main menu, select SOFT-
ADE.

.

Upgrade screen appears. See

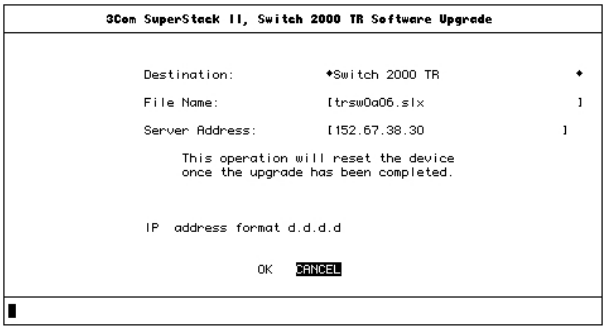
3Com SuperStack II, Switch 2000 TR Software Upgrade
Destination: *Switch 2000 TR *
File Name: [trsw0a06.slx]
Server Address: [152.67.38.30]
This operation will reset the device
once the upgrade has been completed.
IP address format d.d.d.d
OK
CANCEL

Figure 3-14 Software Upgrade Screen

3 In the Destination field, press [Space Bar] until *Switch 2000 TR* appears.

The Destination field identifies the device that will receive the software upgrade.

4 Enter the name of the file in File Name field.

This name identifies the file that contains the software image to be downloaded. You must place the image file in a location where it is accessible to the TFTP load request. Check with your system administrator if you are unsure of where to place the image file.

5 Enter the address of the Server where the image is stored.

The address identifies the host that contains the software image.

6 Select OK.

The software download begins. While the download is under way, the MGMT LED flashes green and the

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en the download completes, the
utomatically resets and re-boots
ware image.

ield, enter "UNIT # n".

ies the unit ID of the unit from
oad occurs. In most cases this unit
nit: Unit # 1.

wnloads the software image from
other units in the stack

ftware

nd TR-in-FE Modules have their own
upgraded independently of the
f you own one of these modules,
pgrade the software.

ware upgrade for a module, follow
rading Software" above, except in
Module, FDDI Module, or TR-in-FE
stination field.

tion regarding these modules, see:

witch 2000 TR ATM OC-3 Module
rt Number #99041)

witch 2000 TR FDDI Module User
mber #99048)

witch 2000 TR Token Ring-in-Fast
le User Guide (Part Number

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witch 2000 TR

rovides instructions for resetting the TR.

e configurable parameters require that Switch 2000 TR after making changes, it o understand the reset procedure before

r different ways to reset the Switch 2000

nsole

ole

on

e

set

000 TR must be reset after making cer- using the VT100 interface. You may an one change before committing them y resetting.

witch 2000 TR from the VT100 interface ve made changes, take these steps:

from the Switch 2000 TR Main Menu.

000 TR TR Reset screen appears. See

confirm the reset or CANCEL to stop the elect OK you will be prompted to con-

The Switch 2000 TR resets.

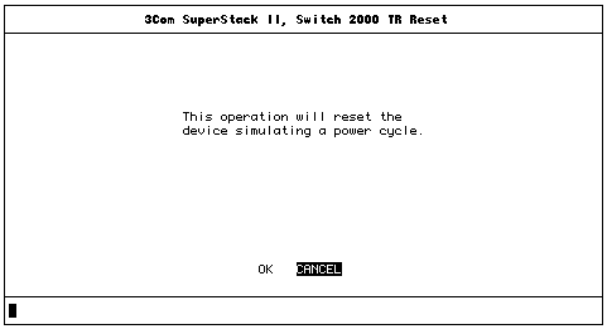

Figure 3-15 Switch 2000 TR Reset Screen

LCD Console Reset

When you make certain parameter changes using the front panel LCD console, you must commit them to system memory by performing a reset.

To reset the Switch 2000 TR using the LCD, proceed as follows:

1. Press [Up or Down Arrow] until **Switch 2000 TR>Reset** appears.
2. Press [Enter].

   The Confirm RESET? screen appears.
3. Press [Enter] to confirm.

   If you decide not to reset at this point you may press [Left Arrow] to cancel and return to the previous screen.

   The Switch 2000 TR resets.

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TR has a reset button on the rear
See Figure 3-16.

h 2000 TR using the Reset button,
s:

utton on the rear panel of the

nce.

resets.

anel Reset button also provides
rgency Software Download facility.
e quickly to view. Refer to
ore information.

TR can also be reset by removing the
the rear panel of the unit.

h 2000 TR by removing the power
teps:

cord on the rear panel of the Switch

r cord from the power socket.

ord.

resets.

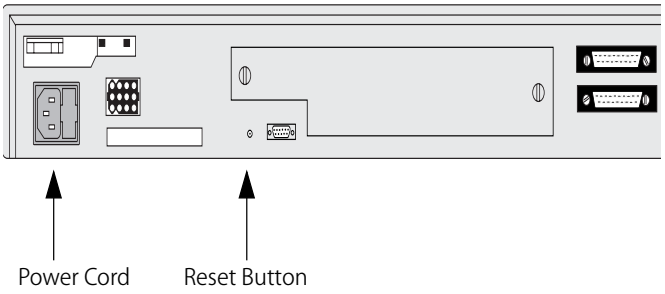

Figure 3-16 Location of Reset Button and Power Cord on the rear panel of the Switch 2000 TR.

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CONFIGURING WITH THE VT100 INTERFACE

nsole is accessed via the serial console
access to all configuration, manage-
nitoring facilities.

p
figuration
guration
e Configuration
e Configuration
figuration
figuration
guration
tive Configuration
Switch Database (SDB)
abase Configuration
Configuration
Configuration
the Switch 2000 TR

strates the portion of the VT100 inter-
ains to the configuration parameters.
rmation on the VT100 interface, refer to

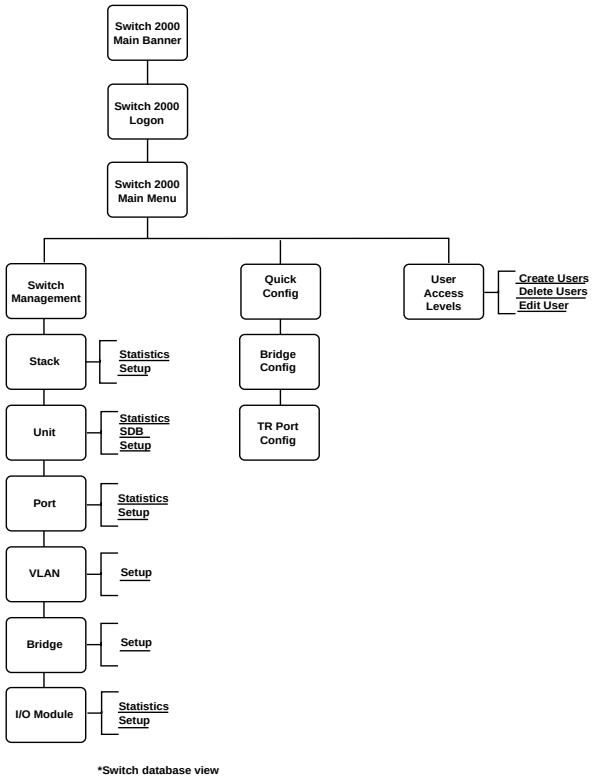

Figure 4-1 VT100 Configuration Path

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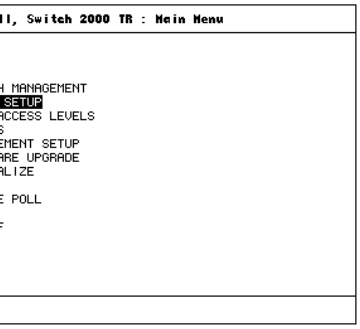
option provides direct access to the
TR Port Setup screens.

tch 2000 TR.

ppears. See Figure 4-2.



Quick Setup Highlighted

enu, select Quick Setup.

screen appears. See Figure 4-3.

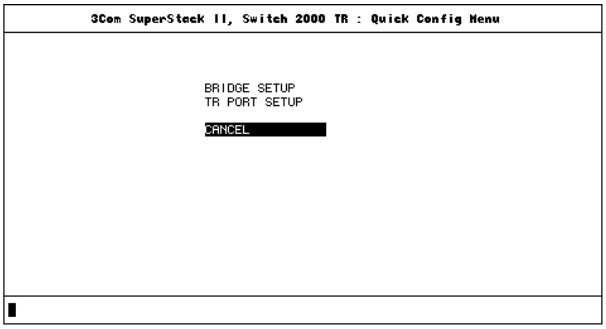


Figure 4-3 Quick Config Screen

3 From the Quick Config screen, select either Bridge Setup or TR Port Setup.

See the "Bridge Configuration" and "Port Configuration" sections for information about the setup screens.

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ation

nfiguration section includes information ing:

uting Transparent (SRT)

ute (SR)

t (TP)

Tree Fields

uting Transparent (VT100)

idge setting requires that you reset the to "Resetting the Switch 2000 TR in instructions.

Switch 2000 TR.

Management from the Main Menu.

Bar] and select *Bridge*.

The TR Bridge Setup screen appears.

```
Stack II, Switch 2000 TR Bridge Setup

s:  28
    ♦SRT              ♦
    ♦Disabled♦
     Not Applicable
    [1] Hex


eters              Transparent Parameters

2768]                 Entry Age: [300  ] seconds
 ]   seconds
0]   seconds
5]   seconds

SETUP                  CANCEL
```

etup Screen

5 Select OK.

6 Select *SRT*. Press [Space Bar] to change.

7 Press [Return].

8 Select *IBM*, *802.1d*, or *disabled* in the Spanning Tree Support field. A BPDU value is automatically assigned:

- 802.1d Spanning Tree—80-01-43-00-00-00
- IBM Spanning Tree—C0-00-00-00-01-00

9 Assign a Bridge Number. Enter in Hex. Choose from 0 to f.

10 Select OK.

11 From the Main Menu, press [Space Bar] until *Port* appears. Select the proper unit and port ID to configure.

12 Select SETUP. The TR Port Setup screen appears. See Figure 4-5.

```
                3Com SuperStack II, Switch 2000 TR Port Setup

   Unit ID: 6                          MAC Address:       0002ba83c751
   Port ID: UNKN
   Admin. State:    ♦Disabled♦         VLAN ID:           [1 ]
   Personality:     ♦Adapter♦          Internal Priority: ♦Normal♦
   Congestion Ctrl: ♦Non-Blocking♦     Token Priority     ♦Normal  ♦
   Speed:           ♦16 Mbit/sec♦
   Forwarding Mode: ♦Cut-Thru      ♦   Forwarding State:  Cut-Thru

Dynamic Cut-Thru Control
   Rising Threshold%:   [0 ]           Loc. Adm. Address: [000000000000]
   Falling Threshold%:  [0 ]           Range: 400000000000-7FFFFFFFFFFF

Broadcast Storm Control
   Rising Threshold%:   [0 ]           Rising Action:     ♦none        ♦
   Falling Threshold%:  [0 ]           Falling Action:    ♦none        ♦

                    OK        BRIDGE          CANCEL
```

Figure 4-5 TR Port Setup Screen

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the TR Port Setup screen, select
Bridge Setup screen appears. See

```
Switch 2000 TR Port Bridge Setup

                Source Routing

   Attached Lan Id:   [FFFF] Hex
   Max Route-Desc:    [8]
   STE Mode:          *Auto-span*

                CANCEL
```

o Screen

AN ID field, enter the LAN ID in hex.
de field, select *Auto-Span*.
for all ports as desired.

Bridging

tch 2000 TR.
enu, select Switch Management.
and select *Bridge*.
TR Bridge Setup screen appears.
field, select *Source-route only* by
ce Bar].
ree Support field, select *IBM*. The
omatically assigned:
00

7 Assign a Bridge Number. Enter in Hex from 0 to F.

8 In the Max Age field, type 6.

9 In the Forward Delay field, type 4.

10 Select OK.

11 In the TR Management screen, press [Space Bar] until *Port* appears. Select SETUP. The TR Port Setup screen appears.

12 At the bottom of the TR Port Setup screen, select BRIDGE. The TR Port Bridge Setup screen appears.

13 In the attached Lan Id field, enter a LAN ID in hex (0-FFF).

NOTE:*A value of FFFF indicates an unassigned LAN ID. Use FFFF if the port is either unused or attached to a transparent-only segment.*

14 In the STE Mode field, select *Auto-span*.

15 Select OK. Repeat for all ports as desired.

Setting Transparent Bridging

NOTE:*This bridge setting requires that you reset the switch. Refer to "Resetting the Switch 2000 TR in Chapter 3 for instructions.*

1 Log on to the Switch 2000 TR.

2 From the Main Menu, select Switch Management.

3 Press [Space Bar] and select *Bridge*. The TR Bridge Setup screen appears.

4 In the Bridge Type field, select *Transparent-only*.

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ng Tree field, select *802.1d* to enable
liant Spanning Tree for the Switch 2000
value is automatically assigned:
00-00.

peat for all ports as desired.

ds

e is an algorithm designed to eliminate
orks. The algorithm detects and logically
ndant paths by placing some bridge
locking state so that only one route exits
two LANs and therefore any two sta-
panning Tree eliminates redundant
twork reconfigures and stabilizes. Any
vork topology changes the algorithm
re-learns the new configuration and
idge ports accordingly. This guarantees
ns are connected.

ee Parameters

parameters are components of the
e algorithm. These are set to factory

This setting influences the choice
ne root bridge and the designated
e bridge with the lowest priority is the
ikely to be used as the root bridge by
Tree.

—The period of time that must
tween sends before a MAC address is
t" (removed) from the switch data
sparent bridging table).

- **Bridge Hello Time**—The period of time between the generation of configuration messages by a root bridge is known as Hello Time.

  In networks where the probability of losing configuration messages is high, a short Hello Time is desirable. In networks that are fairly stable, a longer time lowers the overhead of the Spanning Tree algorithm.

- **Bridge Max. Age**—Maximum Age determines the amount of time the current Spanning Tree configuration data is judged too old and discarded from the Switch 2000 TR's memory. Maximum Age should never be reached in a properly configured Spanning Tree.

  If this value is too small, the Spanning Tree must configure too frequently. If this setting is too high the network requires more time to adjust to changes in the topology.

- **Forward Delay**—The Forward Delay value determines the amount of time the Switch 2000 TR spends in the "listening "and "learning" states. This prevents the forwarding of data packets until all parts of the topology have been notified of a change in the topology.

  A low value can result in temporary loops as the Spanning Tree reconfigures the topology. A setting that is too high forces the network to wait longer for Spanning Tree to reconfigure the topology.

NOTE:*For more information on Spanning Tree and bridging concepts refer to* ***Interconnections:Bridges and Routers*** *by Radia Perlman. Addison-Wesley Publishing Company, Reading MA. © 1992.*

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ation section includes directions for
of the Switch 2000 TR, including:

/
/
ntrol

ode
shold%
stered Address
m Control
tings
Fields

in the Port Setup screens are "live"
e effect immediately unless other-

tion on the port, refer to "Port Sta-
6.

tch 2000 TR.
nagement from the Main Menu.

3 Press [Space Bar] and select *Port*.

4 Enter the desired port and unit ID.

5 Select SETUP. The TR Port Setup screen appears.

```
                3Com SuperStack II, Switch 2000 TR Port Setup

   Unit ID: 6                              MAC Address:       0002ba83c751
   Port ID: UNKN
   Admin. State:     *Disabled*            VLAN ID:           [1 ]
   Personality:      *Adapter*             Internal Priority: *Normal*
   Congestion Ctrl:  *Non-Blocking*        Token Priority     *Normal  *
   Speed:            *16 Mbit/sec*
   Forwarding Mode:  *Cut-Thru       *     Forwarding State:  Cut-Thru

Dynamic Cut-Thru Control
   Rising Threshold%:   [0 ]               Loc. Adm. Address: [000000000000]
   Falling Threshold%:  [0 ]               Range: 400000000000-7FFFFFFFFFFF

Broadcast Storm Control
   Rising Threshold%:   [0 ]               Rising Action:     *none         *
   Falling Threshold%:  [0 ]               Falling Action:    *none         *

                    OK        BRIDGE            CANCEL
```

Figure 4-7 TR Port Setup Screen

Setting the Port Admin. State

Use the Admin. State field to enable or disable individual ports.

1 Set this field by toggling the [Space Bar].

2 Press [Return].

Setting VLAN ID

The VLAN ID field allows you to assign ports to a VLAN (workgroup) which can only communicate with other ports in the same VLAN. You have the ability to assign ports to up to 15 separate VLANS. VLANs are

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heir VLAN ID. All ports are configured VLAN 1.

y entering the desired VLAN number for ort.

.

nality

gh 4 on the Switch 2000 TR can be set or *Hub*. In "adapter" mode, the port o a token ring hub such as a SuperStack 'hub" mode, the port acts like a hub support a directly-connected worksta- Ports 5 through 12 support "adapter"

dapter cable can be used to directly tations to ports 5 through12.

y toggling the [Space Bar] to your

.

ties

TR has two fields for setting priority:

riority—The Internal Priority field allows ribute the available bandwidth among High-priority ports are given priority nternal resources, taking priority over ority ports. Settings are High or Normal.

ority—The Token Priority field deter- priority of a token ring port on the 00 TR when transmitting to a segment.

For example: In Normal-priority a token level of 4 is reserved and all packets are transmitted with a token priority of 4 or higher, if necessary. In High-priority mode, a token level of 6 is reserved and all packets are transmitted with a token priority of 6 or higher, if necessary.

If Token Priority is disabled on a port, then packets are transmitted from that port with the priority token that is available at the time. Token Priority is turned off if disabled.

1. Set this field by toggling the [Space Bar].
2. Press [Return].

Setting Congestion Control

Congestion Control provides a method for determining how the Switch 2000 TR reacts in high-traffic load scenarios. Rather than discarding packets, this unique feature allows you to control the flow of traffic by assigning alternate methods for traffic handling. Choices:

- **Flow Control**—Flow Control allows you to eliminate frame loss by buffering excess frames at the end station where space is available until the Switch 2000 TR's buffers are free. Once the buffers on the Switch 2000 TR are free, the end station's buffers are emptied to the Switch 2000 TR and packet loss is eliminated.
- **Non-blocking**—Non-blocking is the factory default state. In this mode frames are forwarded to available destination rings. This occurs even if a frame has been buffered due to a busy or down

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he queue. The frame that has been
e busy or down queue is discarded
able packets can proceed.

the disabled mode, neither Flow
-blocking are in use.

ne of the aforementioned fields by
ce Bar].

ta rate of ports. Choices:

efault)

ggling the [Space Bar].

ode

g mode for individual ports using
:

ard—In this mode, packets are
uffered (stored) in their entirety until
rded. Errored frames will not be for-
source ring. Although this guaran-
bility, it also involves a transit delay.

t-thru avoids the transit delay found
re-and-forward methods. Cut-thru
plied between ports that are operat-
e wire speed or from a high-speed
peed port.

- **Dynamic Cut-thru**—Dynamic Cut-thru monitors the error rates on the port. If a user-defined threshold is exceeded, the switch port changes to store-and-forward until the error rate reduces. Once the error rate is reduced, the switch returns to cut-thru mode.

1. Set this field by toggling the [Space Bar].
2. Press [Return].

Dynamic Cut-Thru Threshold%

The Dynamic Cut-Thru Threshold% field allows you to view the forwarding mode threshold percentage, which determines the degree to which errored packets are allowed to pass before the Switch 2000 TR reverts to Store & Forward mode. These thresholds apply only when the Switch 2000 TR is configured in Dynamic Cut-thru mode. The two threshold fields are:

- **Rising Threshold**—When this threshold is exceeded, the Switch 2000 TR reverts to Store&Forward mode.
- **Falling Threshold**—When this threshold is crossed, the Switch 2000 TR reverts to Cut-thru mode.

Setting the Locally Admin. Address

The Locally Administered Address field allows you to assign individual MAC addresses to each port. This feature is useful for identifying specific ports by their addresses.

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ly Administered Address, take these
ocally Admin. field:

in hexadecimal.

between 400000 000000 and

tch 2000 TR.

cally Administered address will not be
Switch 2000 TR is reset. Refer to
e Switch 2000 TR in Chapter 3 for
n resetting.

Locally Administered address and revert
t MAC address enter all zeros and reset
000 TR.

Storm Control

000 TR automatically creates an alarm
ports for monitoring broadcast levels if
t. This field allows you to set broadcast
els on each port. You can also set the
on per port. Thresholds are calculated
ng 20 second window.

hold%

reshold percentage setting determines
f broadcast traffic that will be allowed
rm is sent. The default setting is 60%.

Falling Threshold%

The Falling threshold percentage setting determines the level at which the broadcast threshold will be reset. This setting prevents the rising threshold events from being triggered continuously. Events are only enabled after the Falling Threshold is met. The default setting is 50%.

1. Set the threshold fields by entering a number between 0 and 99.
2. Press [Return].

Rising Action

Use this field to set alarm action for the rising threshold. You have the following choices:

- **None**—No action
- **Event**—Event generated for SNMP
- **Blip**—Port disabled, then enabled after 5 seconds
- **Event+blip**—Port disabled, then enabled after 5 seconds and event generated

Falling Action

Use this field to set the action for the falling threshold. Choices:

- **None**—No action. Default
- **Event**—Event generated

1. Set the action fields by toggling [Space Bar] to the desired threshold actions.
2. Press [Return].

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uration

Tree and Source Routing fields for
Bridge selection, located at the
t Setup screen. Choices are:

ID

sc

up screen, perform these steps.

om the lower portion of the Port

TR Port Bridge Setup screen
re 4-8.

```
Switch 2000 TR Port Bridge Setup

                Source Routing

        Attached Lan Id:   [FFFF] Hex
        Max Route-Desc:    [8]
        STE Mode:          *Auto-span*

                CANCEL
```

Port Bridge Setup Screen

parameters as follows:

- **Priority**—Port priority determines the choice of port when the Switch 2000 TR has two ports connected to the same LAN, creating a loop.

  The port with the lowest value has the highest priority and is deleted by Spanning Tree first.

- **Path Cost**—Path cost determines the amount of overhead required to forward packets to the root through this port.

  The higher the path cost, the less likely Spanning Tree will use a port for forwarding. The lower the cost, the more likely Spanning Tree will use a port for routing.

3 Set the Source Routing parameters by toggling the [Space Bar] as follows:

- **Attached LAN ID**—A unique number that identifies the segment to which port is connected. This value can be set between 0 and FFF (0-4095). A value of FFFF (65535) indicates that no segment number has been assigned to this port.
- **Max. Route-Desc**—This value describes the number of routing descriptions allowed in All Route Explorer (ARE) or Spanning Tree Explorer (STE) frames. This is also referred to as "hop count" limit since it limits the number of rings a packet can traverse.
- **STE Mode**—This value determines how this port responds when presented with Spanning Tree Explorer (STE) packets. Set fields accordingly by toggling the [Space Bar].
  - **Disabled**—Indicates that the port will not accept or propagate STE packets and any packets received will be discarded.

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— Indicates that the port will always
and propagate STE packets.

pan—Indicates that the port will accept
pagate STE packets when its Spanning
te is forwarding.

*ng Tree does not have to be enabled for
on correctly.*

save changes.

figuration

onfiguration allows you to set up for the
dule options:

nformation on configuring your module
eir respective manuals:

k II Switch 2000 TR ATM OC-3 Module
e

k II Switch 2000 TR FDDI Module User

k II Switch 2000 TR TR-in-FE Module
e

Stack Configuration

Stack configuration allows you to set these stack attributes:

- sysName
- BootP Client

NOTE:*All settings in the Stack Setup screens are "live" settings. They take effect immediately.*

For more information on the stack, refer to "Stack Status in Chapter 6.

Setting Up the Stack

1. Log on to the Switch 2000 TR.
2. Select Switch Management from the Main Menu.
3. Press [Space Bar] and select *Stack*.
4. Select SETUP. The TR Stack Setup screen appears. See Figure 4-9.

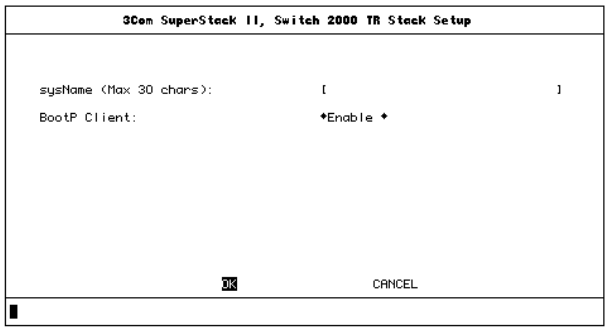

Figure 4-9 TR Stack Setup Screen

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e

l allows you to assign an identifying
. This name is displayed on the top

ation of up to 30 alpha or numeric
dentifier. Spaces are allowed.

enabled and you have a BootP
work, an IP address will be assigned
he Switch 2000 TR at power up.

n

creen allows you to:

VLANs, if those ports use Port

one port for each VLAN

up information for the Switch

N Setup screen:

Main Menu, select SWITCH MAN-
witch Management screen appears.

nt Level field, choose VLAN.

P button. The VLAN Setup screen
in Figure 4-10.

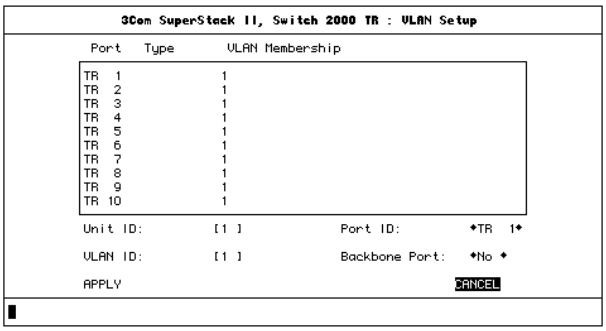

Figure 4-10 VLAN Setup Screen

The screen shows a listbox containing three fields:

- **Port**—This field allows you to select the ID of the port that you want to set up.
- **Type**—This field displays information about the setup of the port:
  - **Bp**—The port is a Backbone port for the VLAN(s) specified in the VLAN Membership field.

    A backbone port is used to connect each VLAN to the backbone of your network, and has the following attributes:

    Addresses received on the port are not stored in the Switch Database.

    Frames with unknown addresses received by the Switch are forwarded to the port.

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The port is an ATM OC-3c Module port. e information, see the ***SuperStack II ATM OC-3c Module User Guide.***

mbership—This field displays the ID of s) to which the port belongs.

—This field displays the ID of the port y selected in the listbox.

D—**T**his field allows you to enter the ID VLAN to which the port is assigned. All y default belong to VLAN 1.

ort—If the port specified in the Port ID t VLAN Mode, this field allows you to her the port is a backbone port. Any port be designated as the backbone port for ut you can only have one backbone port default, all ports belong to the Default 1). Because of this, an unconfigured an only have one backbone port.

that an ATM OC-3c Module port is a rt, the port becomes a backbone port for on which it is active. It cannot be the rt for one VLAN and a standard port for

fit a Plug-in Module into a Switch with backbone ports, the Module automati- s the backbone port for the Default ou power up or initialize the Switch. If a Plug-in Module, the high speed cas- e becomes the backbone port for the when you power up or initialize the

APPLY—This button applies any changes to the VLAN database.

VLAN LEC Setup—If the port is an ATM OC-3c Module port, this button allows you access the VLAN LEC Setup screen for extending your VLANs into an ATM network. For more information, see the ***SuperStack II Switch ATM OC-3c Module User Guide.***

Assigning a Port to a VLAN

1. In the Port ID field, type the ID of the required port.
2. In the VLAN ID field, type the ID of the required VLAN.
3. Select APPLY.

CAUTION: *Initially, all Switch ports belong to the Default VLAN (VLAN 1). This VLAN is the only VLAN which allows an SNMP Network Manager to access the management agent of the unit. If you remove all ports from VLAN 1, then an SNMP Network Manager cannot manage the Switch.*

Specifying a Backbone Port

1. In the Port ID field, type the ID of the required port.
2. In the VLAN ID field, type the ID of the required VLAN.
3. In the Select Port Type field, select Backbone Port.
4. Select APPLY.

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n allows you to view these unit

tion on the unit, refer to "Unit Sta-
6.

tch 2000 TR.

nagement from the Main Menu.

and select *Unit*.

e unit you wish to set up.

TR Unit Setup screen appears. See

fies the number of the unit for pur-
management. If you are managing
TR using Transcend Enterprise Man-
s you to identify the unit in a stack.
pears at the bottom of the stack.
pears at the top of the stack.

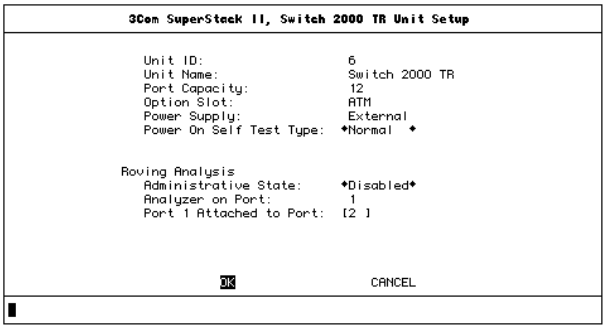

Figure 4-11 TR Unit Setup Screen

Unit Name

Unit Name identifies the type of unit.

For example: Switch 2000 TR

Port Capacity

Indicates the number of ports on a unit.

Option Slot

Identifies any module options activated within the unit.

Power Supply

Identifies the power source as follows:

- **Internal**—Through the internal power supply of the Switch 2000 TR.
- **External**—Through a Redundant Power System (RPS).

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elf Test

to specify the type of self-test to run at

A 10 second test that verifies the Switch basic functions.

—A more comprehensive test that lasts seconds.

ysis

ving fields to set up the Roving Analysis

rative State—Allows you to *enable* e* the Roving Analysis function of port 1 tch 2000 TR. When this field is enabled, he Switch 2000 TR can be connected to lyzer. Roving Analysis is disabled by

on Port—Indicates that Port 1 is the port. This field cannot be changed.

ached to Port—Use to select the port o analyze. Choose from ports 2 through

peed of the Roving Analysis Port must eed of the port you are roving into. Port s original state after the Roving Analysis bled.

Administrative Configuration

This section provides information on the Administrative settings for the Switch 2000 TR.

1 Log on and select USER ACCESS LEVELS from the Main Menu. The TR User Access Levels menu appears. See Figure 4-12.

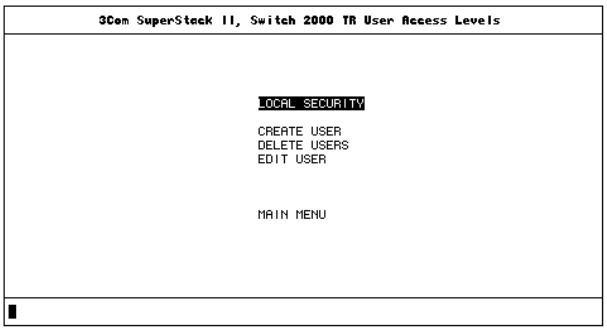

Figure 4-12 TR User Access Levels Screen

The User Access Levels menu allows you to control access to the Switch 2000 TR. Choices:

- **LOCAL SECURITY**—Allows you to view the security for access methods, including serial port, remote Telnet, and Community-SNMP.
- **CREATE USER**—Allows you to add as many as ten new users.
- **DELETE USERS**—Allows you to delete any user except the default users.

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llows you to change your password
y. You cannot change other pass-
nunity strings.

tem you want and see the appropri-
d instructions on the following

rity screen displays a matrix of
security levels. Choices:

ows read-only access to a restricted
able parameters.

or—Allows read-only access to all
arameters.

ows read and write access to opera-
ers of the Switch 2000 TR, but not
rity features.

lows access to most manageable
cept security features.

ows access to all manageable

ACCESS LEVELS screen, take these

URITY

screen appears. See Figure 4-13.

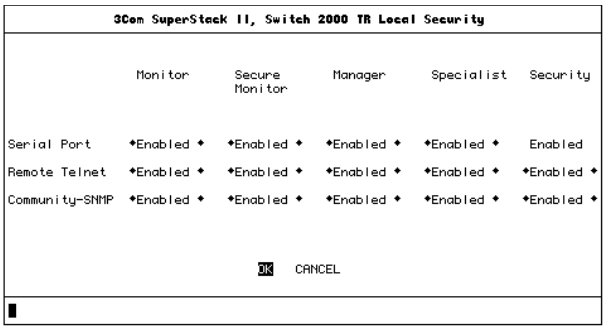

Figure 4-13 TR Local Security Screen

2 Fill in the fields according to these descriptions:

- **Serial Port**—Allows or prevents access to the management facilities via the serial port. You can enable or disable access for each of the security levels, including, Monitor, Secure Monitor, Manager, Specialist.

  For security reasons, the serial port access for security level is enabled by default and cannot be changed.

- **Remote Telnet**—Allows or prevents access to the management facilities via the TCP/IP Telnet protocol. Because Telnet has no provision for security and provides access to everyone, you can disable it if your network has important or sensitive data.

- **Community-SNMP**—Allows or prevents access to the management facilities via SNMP using a remote network management application. Although SNMP has limited security features, it is an unsecured protocol. You can disable SNMP access if your network has important or sensitive data.

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en you are finished filling in the fields.

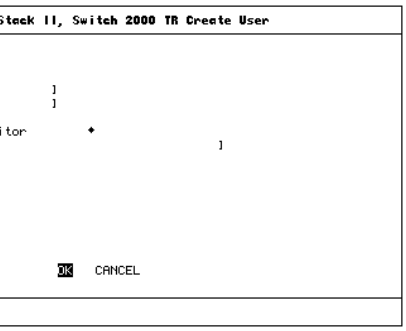
rs

steps to create new users and assign
o the Switch 2000 TR.

USER ACCESS LEVELS screen:

E USER.

User screen appears. See Figure 4-14.



User Screen

ne and password fields according to
ions and your network needs. Press
filling in each field.

e—Enter a name for the new user using
an 10 characters. This field is case sensi-

—Allows you to enter the password for
ser. Passwords can contain up to 10 characters and are case-sensitive. Passwords are not displayed on screen.

3 Assign access levels according to these descriptions and your network needs. Toggle the [Space Bar] to view the levels.

- **Access Level**—Allows you to assign access level for new user as follows:
  - Monitor
  - Secure monitor
  - Manager
  - Specialist
  - Security

4 Press [Return] after assigning a level.

- **Community String**—Assign a community string using any text string of 32 characters or less. The community string is only needed for SNMP access. If you are using a remote SNMP network manager, the community string specified in the network manager's database must be the same as that for the device. The user name is the default.

5 Select OK when you are finished filling in the fields.

Deleting Users

The following steps allow you to delete users from the Switch 2000 TR database. From the TR USER ACCESS LEVELS screen, take these steps:

1 Select DELETE USER.

The Delete Users screen appears. See Figure 4-15.

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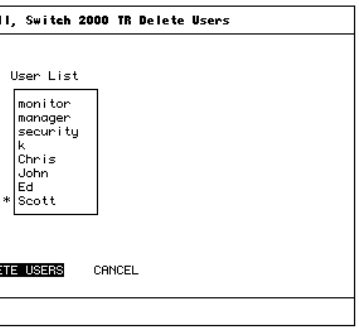
own Arrow] until you highlight the delete. You cannot delete default nt user (that is, yourself).



een

delete user.

next to the name you have chosen to

ERS to delete the user from the User

nging Passwords

rmation about existing users in the atabase. From the TR USER ACCESS ke these steps:

r screen appears. See Figure 4-16.

ish to edit, including:

- **User Name**—This read-only field displays the name of the user. This field cannot be changed using this screen. To change the name of the user, delete the user and create a new name.
- **Old Password**—Enter the old password for this user.
- **New Password**—Enter the new password for this user.
- **Confirm Password**—Re-enter the new password for verification.
- **Community String**—Enter a new community string.

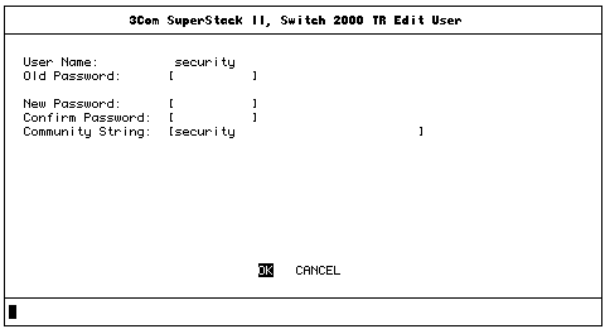

3Com SuperStack II, Switch 2000 TR Edit User
User Name: security
Old Password: [ ]
New Password: [ ]
Confirm Password: [ ]
Community String: [security]
OK CANCEL

Figure 4-16 TR Change User Screen

3 Select OK when you have completed the changes.

NOTE:*If you forget your password while logged into the Switch 2000 TR, contact your local technical support representative for the next step.*

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h Database (SDB)

000 TR supports a database of transpar-
received on its local ports. Using this
he Switch 2000 TR determines whether
frame should be forwarded or filtered.
holds a maximum of 2000 entries, each
udes the MAC address and an identifier
n which it was received.

000 TR Unit Database View allows you
intain, and view the Switch 2000 TR

eport the database status as follows:

90% full

100% full

dicate that the maximum number of users
about to be met. When the maximum
een met, you cannot add any more users to
ntil some are removed. This limitation does
sers connected to the remainder of the net-

000 TR database has two types of

ries—Initially, all entries in the database
ng type. As traffic moves through the
00 TR, device addresses are learned and
ries are removed (aged out) if the device
nsmitted any packets for a set period of
time (aging time). This practice prevents the database from filling with obsolete entries. When a device is removed from the network, its entry is deleted from the database. Using an SNMP-based management application or the VT100 console (serial port or Telnet session), you can set the aging time (set in seconds) with a default of 5 minutes. Aging entries are deleted if the Switch 2000 TR is reset or turned off.

- **Permanent Entries**—Permanent entries are retained in the database even when the Switch 2000 TR is reset or powered down. Addresses are made permanent by a system administrator via a network manager application and the switch database. Refer to "Switch Database Configuration" for more information.

Database Entry Methods

Entries to the database happen in two ways:

- The Switch 2000 TR can learn up to 2000 addresses. Addresses include the source MAC address and the port identifier of the port on which the source MAC address is seen. Addresses are not learned on the designated downlink.
- The system administrator can enter and update entries using an SNMP MIB browser, a network manager application, or the Switch 2000 TR database screen. Refer to "Switch Database Configuration" for more information.

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onfiguration

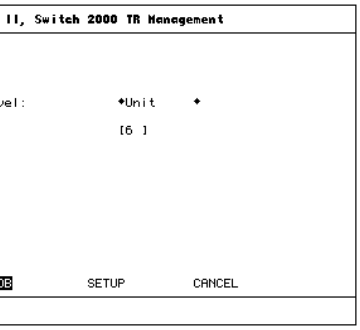
TR Unit Database View screen
up, maintain, and view the data-
ng Database is distributed across the
ou need to choose a unit before you
ddresses learned by that unit.

to the database

s from the database

s in the database

bottom of the Unit Management
he database. See the highlighted
7.



t Screen

e View appears. Refer to Figure 4-18
riptions.

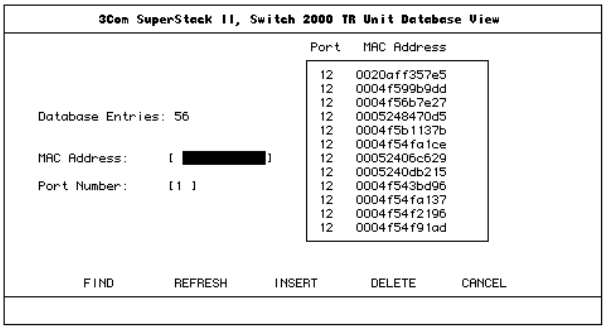


Figure 4-18 Switch 2000 TR Unit Database View Screen

When first powered up, the database appears empty. As addresses are learned or added, they appear in the scrolling list box.

- **Port/MAC Address**—Scrollable list box displays the current entries for each of the ports, except the downlink.
- **Database Entries**—Read-only field displays the number of entries in the database. The database holds up to 2000 addresses.
- **MAC Address**—Field displays the MAC address of a device highlighted in the scrollable list box. Press [Return] to view after you highlight an address.
- **Port Number**—Displays the Port Number of a device highlighted in the scrollable list box. Press [Return] to view after you highlight an address.
- **FIND**—Command allows you to locate any address entry in the database.

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—Command allows you to refresh the
nd display the latest address entries.

Command allows you to add an entry to
se.

Command allows you to remove an
the database.

the Database

t Database View screen, take these

C address of the device you want to add
ddress field.

identifier of the device you want to add
ld.

tered using this method are permanent,
o not age out.

ow] to move to a different port number.

om the Database

t Database View screen, take these

device address you wish to remove and
, or enter the address you wish to
MAC address field.

ow] to move to a different port number.

Finding Entries in the Database

From the Unit Database View screen, proceed as follows:

1. Enter the MAC address of the device you wish to find in the MAC Address field.
2. Select FIND.

   The entry appears highlighted in the list box.

SNMP Trap Configuration

The Switch 2000 TR uses the SNMP protocol to communicate across networks. Traps are messages sent to an SNMP management application. Typical messages include fault and change information.

Many SNMP network management applications have traps that are set automatically. Check the application documentation.

To access the Traps Setup screen, take these steps from the Switch 2000 TR Management Setup menu:

1. Select SETUP TRAPS from the bottom of the TR Management Setup screen.

   The TR Trap Setup screen appears, as shown in Figure 4-19.

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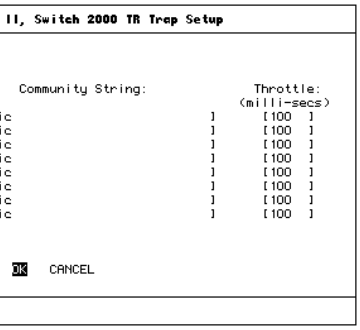

creen

screen has these fields:

nter the network address of the
k management station to which
sent.

tring—Enter a 32-character text
enticating SNMP communication
witch 2000 TR and a remote net-
. The network manager and the
R must be configured with the same

nunity string is ***public.***

vents a remote network manager
too many traps at the same time.
ure the Switch 2000 TR to transmit
specific delay time period known as
unit of throttle is one thousandth of
default value is 100, which provides
tenth of a second between each

Serial Port Configuration

The VT100 interface provides a screen for setting the parameters of the serial port of the Switch 2000 TR. The serial port provides out-of-band communications with the Switch 2000 TR for purposes of local configuration and communication.

To view the Switch 2000 TR Serial Port Setup screen, proceed as follows, from the Switch 2000 TR Main Menu banner.

1 Select Management Setup.

The Management Setup screen appears.

2 Select SERIAL PORT.

The Serial Port Setup screen appears. See Figure 4-20.

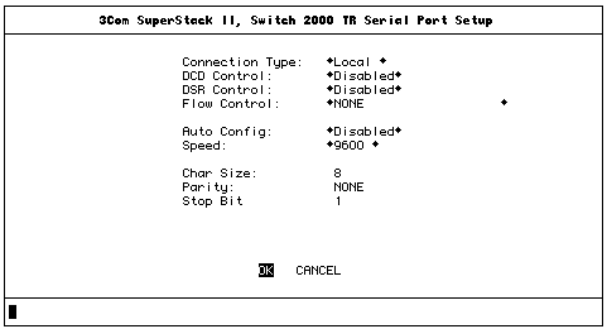

Figure 4-20 Switch 2000 TR Serial Port Setup Screen

NOTE:*If you change any of the serial port parameters, you will terminate any existing sessions that are using the serial port. Be sure that the connecting ter-*

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port parameters match those on the TR. This allows you to continue to access ment facility from the equipment after he serial port parameters.

t Setup screen displays the following:

Type

e Select Remote if you wish to manage 000 TR using a modem; DCD Control trol will be enabled. For all other cases main at Local.

abled This field applies to local con- . This determines if DCD needs to be emote connection and if the connection DCD be released. Refer to your terminal cumentation for more information.

abled This field applies only to local pes. This determines if DSR needs to be emote connection and if the connection DSR be released. Refer to your terminal cumentation for more information.

l

NONE/RTS-CTS al/RTS-CTS Bidirectional Select the control option for your terminal or modem. Refer to your terminal or modem documentation for more information.

Auto Config

Enabled/Disabled The Switch 2000 TR can auto-configure the line speed (baud) to work with your VT100-compatible terminal.

Speed

1200/2400/9600/19200 Select the correct line speed (baud) for your terminal or modem.

Char Size

8 Displays the character bit size for the Switch 2000 TR. You should set your terminal to the same value.

Parity

NONE Displays the parity setting for the Switch 2000 TR. You should configure your terminal to the same setting.

Stop Bit

1 Displays the Stop Bit setting for the Switch 2000 TR. You should configure your terminal to the same setting.

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tch 2000 TR

TR VT100 interface allows you to olatile memory on the unit and ory defaults. Be aware that all con- eters, database entries, and setting l returned to the original factory-set

nitialize the Switch 2000 TR if:

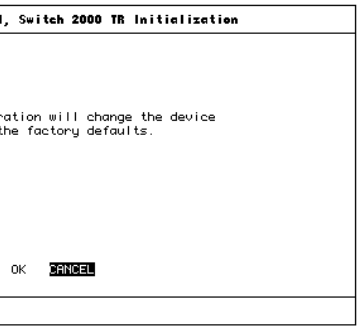
nfiguration scheme no longer suits

pts to solve problems have not suc-

2000 TR Main Menu, proceed as fol-

rom the Main Menu.

creen appears. See Figure 4-21.



Initialization Screen

2 Select OK if you wish to initialize

3 Confirm operation by pressing [Enter].

Switch 2000 TR resets.

Refer to "Device Defaults in Chapter 2 for default information and parameters.

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CONFIGURING WITH THE LCD CONSOLE

describes the Switch 2000 TR LCD Con-
ment facilities and provides procedures
g and managing the device. This con-
ed from the front panel and provides
st configuration, management, and
cilities. This chapter assumes you have
Switch 2000 TR for management.

guration

nfiguration

guration

e Configuration

rmation on the LCD Console, refer to
n Chapter 6 and "Setting Up the LCD
hapter 3.

Unit Configuration

The most important task of setting up the Switch 2000 TR is assigning a Unit ID number to the individual units. When installed as members of a stack, up to 6 Switch 2000 TRs form the equivalent of a switching chassis, managed using the same IP address. All traffic, management, monitoring, and configuration tasks and inquiries operate through the high-speed cascade located at the rear of each unit. The Unit ID number represents the position of the Switch 2000 TR in a stack. Each Switch 2000 TR must be assigned a unique Unit ID number. The LCD Console provides the best method for this task.

To set the Unit ID number, proceed as follows from the Switch 2000 TR>Unit banner:

1. Press [Enter] twice.
2. Using the [Up or Down Arrows], set the Unit ID to #1.

NOTE: *If the unit you are configuring is to be the head unit, it must be the lowest number in the stack.*

3. Press [Enter] to accept (save) the Unit ID #.
4. Press the [Left Arrow] to return to the Switch 2000 TR >Unit screen and complete the remaining LCD configuration tasks as described in this section or use the VT100 console as described in Chapter 4.

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on

n be made using the LCD console. If
ettings using the VT100 interface,
be reflected in the LCD console.
3 for more information on navigat-
ole.

f the steps in the following proce-
e aware that the settings will vary
bridging environment you choose.
1 for more information on the types
rted by the Switch 2000 TR.

ge settings (Spanning Tree) will not
he Switch 2000 TR is reset. Refer to
itch 2000 TR in Chapter 3 for
setting the Switch 2000 TR.

2000 TR LCD banner, proceed as fol-

Unit Id appears.

w] until Switch 2000 TR >Bridge

ype appears.

> appears.

w] to select bridge type. Choose

ute Transparent)

- Transparent Bridging
- Source Route

6 Press [Enter] to select appropriate bridge type.

BRIDGE >Bridge Type appears.

7 Press [Down Arrow].

BRIDGE >Spanning Tree appears.

8 Press [Enter].

Spanning Tree: <802.1d> appears.

9 Press [Down Arrow] to select Spanning Tree type. Choices:

- **802.1d**—IEEE 802.1d standard. This setting is typically used for Transparent bridging or Source Route Transparent.
- **IBM**—IBM Spanning Tree standard. This setting is typically used in Source Routing environments.
- **Disabled**—No Spanning Tree support.

10 Press [Enter].

11 Press [Left Arrow] to return to the higher-level screens in the LCD console.

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on

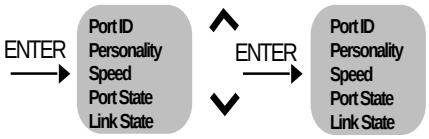
ers can also be set from the LCD console
n 2000 TR front panel. If you have made
the VT100 interface, those settings will
n the LCD console. Refer to Chapter 3
rmation on navigating the LCD console
console map.

re circular, meaning that you can access
ling either up or down. For the sake of
se instructions use only the Down Arrow
ugh the screens.

hese parameters using the LCD console:

de

CD Console menu map (Figure 3-9) for
tion.



e Port Menu

Setting Port ID

From the Switch 2000 TR>Unit Id # LCD banner, proceed as follows:

1. Press [Enter].

   Switch 2000 TR >Unit appears.

2. Press [Down Arrow] until Switch 2000 TR >Port appears.

3. Press Enter.

   Port >Port ID appears with the port number. Initially the port number shows Port 1.

4. Press [Enter].

5. Use the [Up or Down Arrow] to scroll the ports and select the port you wish to configure.

6. Press [Enter] to select the port.

   Port >Port ID appears, and the port number reflects the port number you chose in step 5.

Viewing Link State

Link State reflects the current state of the port and cannot be changed. Refer to "Port Statistics in Chapter 6 for definitions of the states.

From the Switch 2000 TR>Unit Id # LCD banner, proceed as follows:

1. Press [Enter].

   Switch 2000 TR >Unit appears.

2. Press [Down Arrow] until Switch 2000 TR >Port appears.

3. Press Enter.

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w] until Port # >Link State appears.

te] appears.

ntifies the current state of the port

d cannot be changed.

to return to previous menu.

2000 TR>Unit Id # LCD banner, pro-

nit appears.

w] until Switch 2000 TR >Port

w] until Port # >Port State appears.

te] appears.

The Port State identifies the current state of the port you are viewing.

6 Press [Down Arrow] to select the state. Choices:

- Enable
- Disable

7 Press [Enter] to confirm the state.

If you select Disable, the LED for the corresponding port lights yellow to show the current state.

Setting Speed

From the Switch 2000 TR>Unit Id # LCD banner, proceed as follows:

1 Press [Enter].

Switch 2000 TR >Unit appears.

2 Press [Down Arrow] until Switch 2000 TR >Port appears.

3 Press [Enter].

4 Press [Down Arrow] until Port # >Speed appears.

5 Press [Enter].

Speed # [speed] appears.

Press [Down Arrow] to select speed. Choices:

- 16 MB
- 4 MB

6 Press [Enter] to confirm the speed setting.

7 Press [Left Arrow] to return to the previous menu.

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nality

gh 4 can each be configured as either
r "Adapter Port." The Adapter mode is
r these ports. Ports 5 through 12 can
"Adapter Port." Refer to "SuperStack II
TR Front Panel RJ-45 Ports in Chapter 1
rmation.

tch 2000 TR>Unit Id # LCD banner, pro-
vs:

R >Unit appears.

Arrow] until Switch 2000 TR >Port

Arrow] until Port # >Personality appears.

Arrow] to select the state. Choices on
gh 4 only:

-Ports on the Switch 2000 TR are
o act as adapters and therefore, attempt
ng according to Token Ring specifica-
is mode the Switch 2000 TR must be
to a Token Ring hub or MAU.

Switch 2000 TR can also act like a
hub port and provides a direct station
t on ports 1 through 4. This feature is
useful for direct attachment of servers.

5 through 12 are permanent Adapter
not be changed. If you try to change the

personality of ports 5 through 12, you will be warned that your selection is invalid.

7 Press [Enter] to confirm the personality on the port.

I/O Module Configuration

The console provides a quick method for viewing information regarding the FDDI, ATM, and TR-in-FE optional modules. Refer to Chapter 3 for more information on navigating the LCD console.

You can display the following using the LCD console:

- Module Type
- Module State
- Hardware Version #
- Software Version #
- Boot Software Version #

To view I/O module status, proceed as follows from the top LCD menu, which displays the Switch 2000 TR banner. See Figure 5-2.

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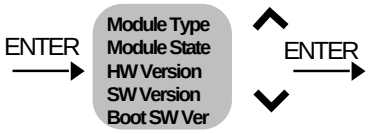

Menus

evel, press [Enter].

Arrow] until **Switch 2000 TR >**

TUS > Module Type appears.

w] to scroll down through the I/O

y one of the following fields to view
escribed below. Press [Down Arrow]
the circular menus.

—One of three module types:

—The current status of the module

The current version of the hardware

The current version of the software
licable for the TR-in-FE module.)

ion—The current Boot software
pplicable for the TR-in-FE module.)

For more information about setting up the modules refer to the documentation that came with them:

- SuperStack II Switch 2000 TR ATM OC-3 Module User Guide (Part Number #99041)
- SuperStack II Switch 2000 TR FDDI Module User Guide (Part Number #99048)
- SuperStack II Switch 2000 TR TR-in-FE Module User Guide (Part Number #99045)

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MONITORING THE SWITCH 2000 TR

provides information on viewing the cur-
g status of the Switch 2000 TR, display-
ng the fault log, and carrying out a
PING).

wing statistics allows you to be sure that
and Switch 2000 TR devices are operat-
By viewing the performance and statisti-
ded by the Switch 2000 TR, you will
performance patterns develop which can
minate problems before they impair the
your network.

ncludes information on the following

tatistics
tics
tics
us

lling (PING)
s

Locating Statistics

See Figure 6-1 to locate specific status, statistics, and polling information. Refer to "LCD Status" for information on retrieving LCD statistics.

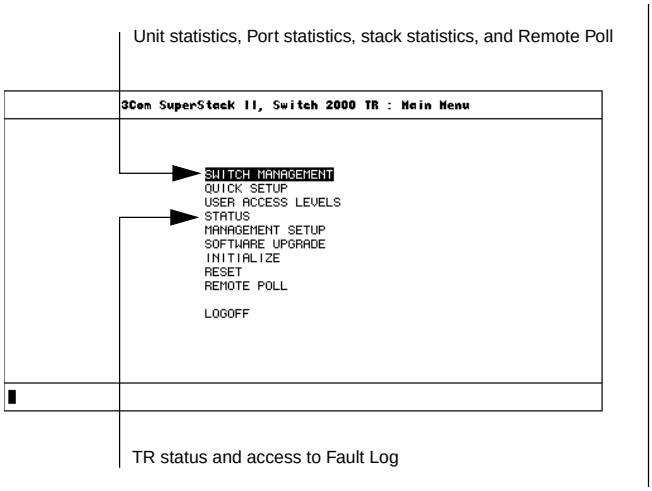

Figure 6-1 Locating Statistic Information and Status

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atistics screen provides an easy
ng per-port performance. It displays
y for each active port. Values are
mately every two seconds. The
after the values reach approxi-
See Figure 6-2.

Statistics screen, take these steps
2000 TR Main Menu:

nagement.

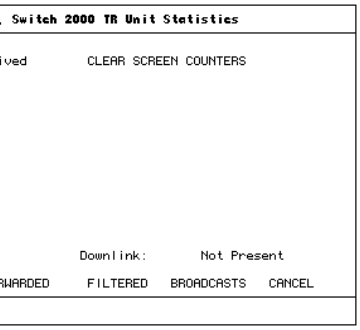
ent screen appears.

until Unit appears.

w] until Statistics highlights.

screen appears.

egory and view.



een

The Unit Statistics screen displays these buttons:

RECEIVED—The total number of frames that have been received by the port including frames with errors.

TRANSMITTED—The total number of frames transmitted by the port, including frames with errors.

FORWARDED—The total number of frames received and then forwarded by the port.

FILTERED—The total number of frames filtered by this port. Frames are filtered because the destination station was on the same segment as the source station.

BROADCASTS—The total number of broadcast frames seen by the port.

CLEAR SCREEN COUNTERS—Use this button to set screen counters back to zero. This clears only counters displayed in the Unit Statistics screen. It does not affect the counters on the device. This prevents remote SNMP stations from seeing network anomalies.

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tatistics screen provides an easy method
dividual port performance. See
R Port Statistics provide more detailed
n individual ports. This screen also pro-
o the Traffic Statistics screen.

R Port Statistics screen, take these steps
tch 2000 TR Main Menu:

Management.

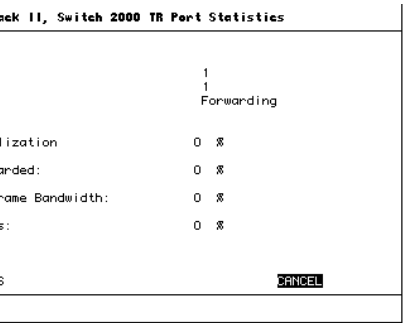
gement screen appears.

Bar] until Port appears.

Arrow] until Statistics highlights.

.

tatistics screen appears.



istics Screen

The TR Port Statistics screen displays this information:

Unit ID—The number of the unit with which the port is associated.

Port ID—The number of the port you are viewing.

Link State—The current state of the port you are viewing. The port states are:

- **Listening**—The state in which all ports are placed while Spanning Tree configures the network topology. Ports remain in this state until the root bridge is selected. This period should be long enough for a port to hear from all other ports on the switch.
- **Learning**—The state in which ports receive data on the topology of the network for the purpose of learning the stations that are attached to the port. If the port receives no information that would force it into the blocking state, then it moves on to the forwarding state.
- **Forwarding**—This state allows the port to perform standard switching and bridging functions. Packets are received and the port either forwards or discards them based on the address of the packet and the switch's address table.
- **Blocking**—In this state, the port continues to receive data on the status of the network topology but does not transmit them. The port also receives no packets nor learns the addresses of stations for forwarding or receiving.
- **Disabled**—The state in which Spanning Tree has been turned off. Port is disabled by management.

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on—The percentage of bandwidth
t you are currently viewing. This
e general traffic level on the individ-
his figure should be below 60%,
hat the port is responsible for a rea-
f traffic relative to the entire ring.

lues suggest that you should adjust
logy by reducing load on that port

ed—A running average of the pro-
eived frames that are forwarded.
ssed as a percentage of all received
a sampling interval of 20 seconds.

e Bandwidth—A running average
rame bandwidth. This value is
rcentage of theoretical maximum
ility, based on a sampling interval

his field displays a running average
of error frames with CRC errors
sampling interval of 20 seconds.

—Select this category to view the
ffic) screen. See the next section.

tics (Traffic) screen provides a more
f statistics for the port you are view-

ing. A typical TR Port Statistics (Traffic) screen appears in Figure 6-4.

```
3Com SuperStack II, Switch 2000 TR Port Statistics (Traffic)

  Unit ID:              6
  Port ID:              1
  Frames Received:      0               Octets Received:      0
  Frames Transmitted:   0               Octets Transmitted:   0
  Multicasts Received:  0               Line Errors:          0
  Broadcasts Received:  0               Frames Forwarded:     0


  Cut-thrus Received:   0               Errors:               0
                                        Lost Frames:          0
                                        Abort Frames:         0
Frame Size Analysis.
  18 to 63 Octets:      0    %          64 to 127 Octets:     0    %
  128 to 255 Octets:    0    %          256 to 511 Octets:    0    %
  512 to 1023 Octets:   0    %          1024 to 2047 Octets:  0    %
  2048 to 4095 Octets:  0    %          GT 4095 Octets:       0    %

                  CLEAR SCREEN COUNTERS          CANCEL
```

Figure 6-4 Sample TR Port Statistics (Traffic) Screen

The TR Port Statistics (Traffic) screen displays this information:

Unit ID—The identifying number of the unit you are viewing.

Port ID—The identifying number of the port you are viewing.

Frames Received—The total number of frames that have been received by the port including frames with errors.

Frames Transmitted—The total number of frames transmitted by the port, including frames with errors.

Multicasts Received—The number of frames successfully received with a multicast destination address. This number does not include frames

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broadcast address or frames received

Received—The number of frames have a broadcast destination address. does not include frames with errors.

ved—The number of octets received by uding the MAC header and CRC. Octet accurate to the nearest 256-byte bound-

mitted—The number of octets trans- port, including the MAC header and ounters are accurate to the nearest ndary.

-The total number of CRC errors that d on the port.

warded—The total number of frames his port and then forwarded to their des- ess.

ceived—The total number of cut-thru ved on the port.

of both line errors (CRCs) and lost

—Frame transmitted by the Switch 2000 ed to make the return trip.

es—Frames transmitted by the Switch need to be aborted by transmitting an er.

Frame Size Analysis—A series of counters that represent the composition of the traffic on the Switch 2000 TR. The counters display the percentage of packets that are categorized by received length as represented by the following octet parameters:

- 18 to 63 octets
- 64 to 127 octets
- 128 to 255 octets
- 256 to 511 octets
- 512 to 1023 octets
- 1024 to 2047 octets
- 2048 to 4095 octets
- Packets greater than 4095 octets

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screen provides easy access to the
ociated with a stack. Units and their
re version currently running on each
C address of each unit displays.

Status screen, perform these steps
2000 TR Main Menu:

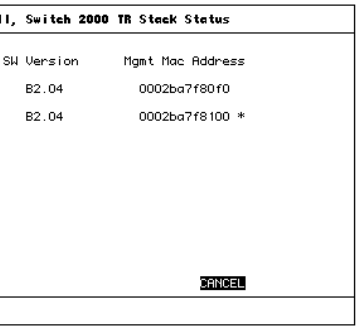
nagement.

ent Screen appears.

until Stack appears.

w] until Statistics highlights

screen appears.



Screen

screen displays this information:

Status—Displays the unit number and the current status and position in the stack.

SW Version—Displays the current resident software version for each unit.

Mgmt MAC Address—Displays the management MAC address for each unit. An asterisk (*) next to a MAC address indicates that the unit is the head unit.

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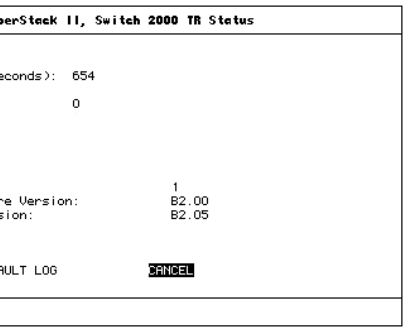
reen provides read-only information
itch 2000 TR. Information provided on
especially useful for troubleshooting and
stem history.

some Status information using the LCD
e front panel of the Switch 2000 TR.
) Status" for more information.

tatus screen, perform these steps using
000 TR Main Menu:

S and press [Return].

reen appears, as shown in Figure 6-6.



n

reen displays the following information:

ime—The elapsed time in seconds since
000 TR was last reset.

Number of Resets—The total number of resets since the Switch 2000 TR was first installed or initialized, by manual power-up, manual reset, or watchdog time-out expiry.

Last Reset Type—The type or cause of the most recent reset on the Switch 2000 TR. Resets may be caused by management command, watchdog time-out, power failure or interruption, a manual reset, or system error. If you experience a problem, give this information to your technical support representative.

Hardware Version—The current hardware version of the Switch 2000 TR. Give this number when you request technical support.

Upgradeable Software Version—The version of the software image stored in Flash EPROM. This version is automatically updated when you download new software. Give this version when you request technical support.

Boot Software Version—The version number of the Boot software stored on the Switch 2000 TR. This number is useful when requesting technical support.

FAULT LOG—Select this button to display the Switch 2000 TR Fault Log. Refer to "Fault Log," next.

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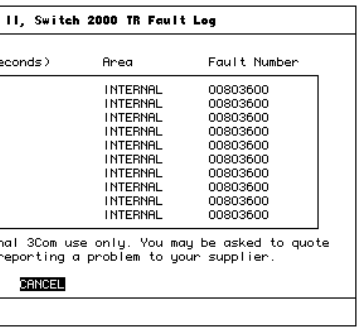
plays read-only information about TR. The Fault Log updates whenever dition occurs. This information is for e only. Your supplier may ask you to nd Fault Number if you report a

Log, take these steps from the Main Menu:

d press [Return].

een appears.

and press [Return].



en

screen appears and the screen dis-
g:

he number of resets recorded at the

Time (seconds)—The time elapsed between the last reset when the fault occurred.

Area—Information useful for fault diagnosis by technical support.

Fault Number—A hexadecimal number indicating the type of fault. Give this number to your technical support representative.

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(PING)

Poll screen allows you to send a single mote device. Use this feature to verify if ce is active and responding. It can help rk problems and is also referred to as

mote Poll feature, take these steps from 000 TR Main Men:

tch 2000 TR Main Menu, select ***Remote***

te Poll screen appears.

```
Stack II, Switch 2000 TR Remote Poll

Address:    [                    ]
rip Time:    no reply

eration will poll the target device.
ress format d.d.d.d

      POLL     CANCEL
```

Poll Screen

ddress of the device you want to poll in dress field.

dress notation conventions as illustrated te Poll screen.

When the poll is complete, the Round Trip Time displays the interval in milliseconds between sending the frame to the target device and receiving a response at the Switch 2000 TR. If the target device does not respond within approximately 10 seconds, the field displays ***no reply.***

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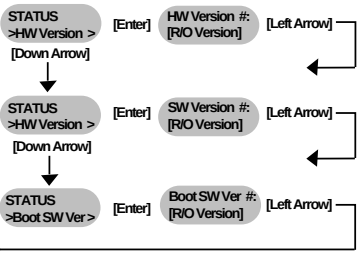
ocated on the front panel of the
rovides useful hardware, software,
n information. Refer to Chapter 5
ion.



tus Chart

tatus, take these steps from the
Unit Id banner:

w] until Switch 2000 TR>Status>

n appears.

pears and displays the hardware ver-
2000 TR.

to return to the STATUS >HW Ver-

5 Press [Down Arrow].

STATUS >SW Version> appears.

6 Press [Enter].

SW Version #> appears and displays the Boot software version stored on the Switch 2000 TR.

7 Press [Left Arrow] to return to STATUS > SW Version>.

8 Press [Down Arrow].

STATUS >BOOT SW Ver> appears.

9 Press [Enter].

Boot SW Ver #: displays the software version stored in the EPROM of the Switch 2000 TR. This version number is automatically updated when you download new software.

10 Use [Left Arrow] to scroll back up through the menus.

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VIRTUAL LANS

provides information on Virtual Local
ks (VLANs). Definitions, benefits, sample
s and concepts of VLANs are described
g:

VLANs?

VLANs

the Switch 2000 TR

rtual Local Area Networks (VLANs) on
000 TR provides you with less time-con-
ork administration and more efficient
ation.

sections explain more about the con-
s and explain how they can be imple-
e Switch 2000 TR.

What are VLANs?

A VLAN is defined as a group of location- and topology- independent devices that communicate as though they were on the same physical LAN. This means that LAN segments are not restricted by the hardware that physically connects them; the segments are defined by flexible user groups that you create using software.

With VLANs, you can define your network according to:

- Departmental Groups—For example, you can have one VLAN for the Marketing department, another for the Finance department, and another for the Development department.
- Hierarchical Groups—For example, you can have one VLAN for Directors, another for Managers, and another for general staff.
- Usage Groups—For example, you can have one VLAN for users of email, and another for users of multimedia.

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ANs on your network has three main

ange and movement of devices on

rol broadcast traffic.

a security.

nge and Movement

networks, network administrators
eir time dealing with moves and
move to a different IP subnet, the IP
endstation must be updated manu-

p, if an endstation in VLAN 1 is
n another part of the network, you
ify that the new port is in VLAN 1,
ning that can be done remotely if
Transcend Enterprise Manager for
d above).

roadcast Traffic

etworks, congestion can be caused
ic that is directed to all network
hey require it or not. VLANs increase
our network because each VLAN
ontain only those devices that need
with each other.

How VLANs Provide Extra Security

Devices within each VLAN can only communicate with devices in the same VLAN. If a device in VLAN 1 needs to communicate with devices in VLAN 2, the traffic must cross a router. Routers have filtering and security features to block unauthorized access.

Figure 7-1 shows a network configured with three VLANs—one for each of the departments that access the network. The membership of VLAN 1 is restricted to ports 1, 2, 3, 4 and 5 of Switch A; membership of VLAN 2 is restricted to ports 4, 5, 6, 7 and 8 of Switch B while VLAN 3 spans both Switches containing ports 6, 7, 8 of Switch A and 1, 2, 3 of Switch B.

In this simple example, each of these VLANs can be seen as a 'broadcast domain'—physical LAN segments that are not constrained by their physical location.

Specific configurations using the Switch are shown later in this chapter.

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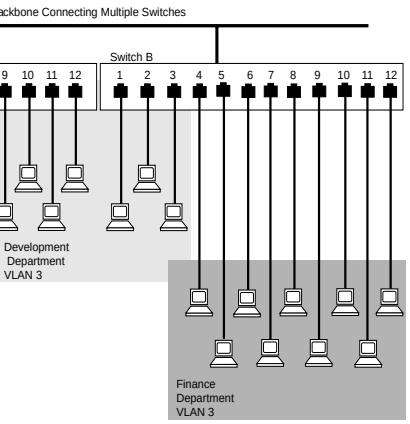

t of VLANs

VLANs and the Switch 2000 TR

The Switch 2000 TR supports VLANs which consist of a set of switch ports. Each switch port can only belong to one VLAN at a time, regardless of the device to which it is attached.

Each Switch 2000 TR can support up to 16 VLANs. However, you can have more than 16 VLANs in your entire network by connecting the 16 switched VLANs to other VLANs using a router.

The Default VLAN and Moving Ports From the Default VLAN

On each Switch, VLAN 1 is the default. It has two properties:

- It contains all the ports on a new or initialized Switch.
- It is the only VLAN which allows an SNMP Network Manager to access the management agent of the unit.

By default, if a device is attached to a port in the Default VLAN and you want to move the device into another VLAN, you need to use the VLAN Setup screen to place the port in that VLAN.

Connecting VLANs to a Router

If the devices in a VLAN need to talk to devices in a different VLAN, each VLAN requires a connection to a router. Communication between VLANs can only take place if they are all connected to the router. A VLAN not connected to a router is isolated.

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VLANs Between Switch Units

0 TR, you typically connect VLANs to
0 TRs and units using ***backbone***
the Switch to forward all frames
address to the rest of the network,
he Switch Database from becoming
ore than 500 addresses in the net-
ou normally require one backbone

ke the Switch-to-Switch connec-
ffective, the Switch 2000 TR allows
t one port forms part of a Virtual
A VLT is a connection that carries
e VLANs between Switch units. If
h ends of a Switch-to-Switch con-
a VLT, you only need that one con-
VLANs.

nly be used for links between
ch 2000 TR units. You cannot use
uter links.

a backbone port on one VLAN is
backbone port becomes a back-
he VLANs on the Switch, even if
bone port before. If you subse-
e VLT function on that port, the port
kbone port for the Default VLAN
ther VLANs lose their backbone

able Protocols

non-routable protocols on your
mple, DEC LAT or NETBIOS), devices

within one VLAN will not be able to communicate with devices in a different VLAN.

Using Unique MAC Addresses

If you connect a server with multiple network adapters to the Switch, we recommend that you configure each network adapter with a unique MAC address.

Extending VLANs into an ATM Network

If the Switch has an ATM OC-3c Module installed, you can extend the VLANs you have defined in your existing network into an ATM network. For more information, see the ***SuperStack II Switch ATM OC-3c Module User Guide.***

Example 1

The example shown in Figure 7-2 illustrates a simple VLAN configuration with a single Switch 2000 TR whose ports are divided between two VLANs. VLAN 1 is able to talk to VLAN 2 using the connection between each VLAN and the router.

To set up this configuration:

1. Use the VT100 screens or VLAN Server database to:
   - **a** Place ports 1-6 in VLAN 1.
   - **b** Place ports 7-12 in VLAN 2.
2. Connect a port in VLAN 1 to the router.
3. Repeat steps 2 and 3 for VLAN 2.

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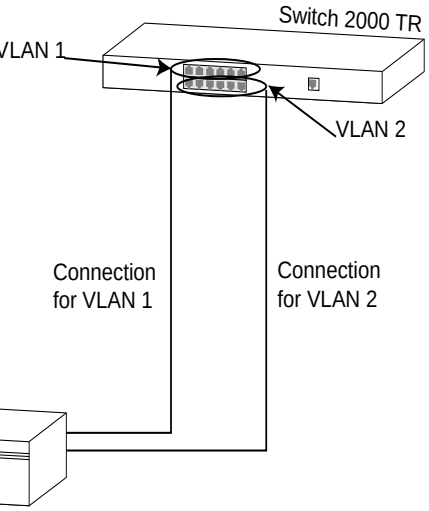

guration with a single Switch 2000 TR unit

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AL LANs

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SOFTWARE UPGRADE UTILITY

ck II Switch 2000 TR has a back-up grade Utility that allows you to:

a new software image if the opera- ge has been damaged. This feature used for emergency situations only!

a new software image for new revi-

Upgrade Utility is also available Switch 2000 TR Main Menu under PGRADE. It is easier to access this util- he Main menu, when it is available. grading Software" in Chapter 3 for ions.

x provides information on configuring Upgrade Utility:

Upgrade Command Utility oard commands for using the Software tility.

Software Upgrade Utility—Proce- configuring parameters. Downloads are -band or from another unit in stack high-speed cascade connection.

Software Upgrade Utility Command Set

At the > prompt you can enter commands followed by a [Return]. The commands are not case-sensitive.

A (ip-address)

Sets the IP address of the Switch 2000 TR. Enter the IP address in dotted decimal format. *For Example:* 192.192.1.1

B

Starts the download.

B (address)

Starts the download and loads the software from the server with the IP address entered.

D (ip-address)

Sets the IP address of the default router. You must set this parameter if the software image is kept on a server beyond a router.

F (filename)

Specifies the filename of the software image file. You must enter this value for a successful download. "UNIT# (1 through 8) is reserved for downloading from another unit in stack.

G

Re-starts the Switch 2000 TR without downloading a new software image. Use this command after using the command R.

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ttings of the Switch 2000 TR and pro-
t for the previous download attempts.
to check that you have entered all the
ry for a successful download.

ts the screen after using the com-

ask in dotted decimal format.

0

000 TR to the factory default values for
Use the G command after using this

rting the Switch 2000 TR erases all
ameters, including IP addressing

he personality (A for adapter, H for hub
4 only) and speed (4 or 16).

port 2 set to adapter or

set for 16 Mbps

of the server that holds the new soft-
s command does not start the down-
mand to start the download.

Starting the Software Upgrade Utility

1. Connect a terminal to the serial port on the rear panel of the Switch 2000 TR. Refer to "Console Port" in Chapter 1.
2. Quickly (within 3 seconds) press the reset button on the rear panel twice. Refer to "Reset Button" in Chapter 1.

   All LEDs on the front panel light and the Software Upgrade Utility appears on the console. See Figure A-1.

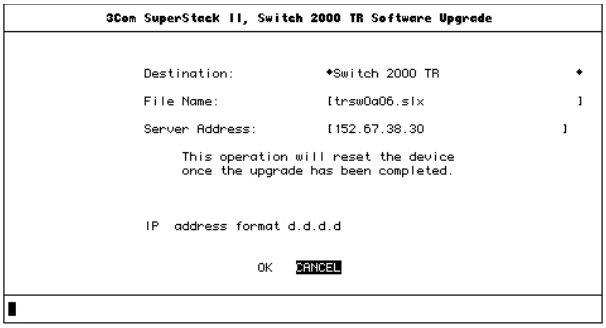
3Com SuperStack II, Switch 2000 TR Software Upgrade
Destination: *Switch 2000 TR *
File Name: [trsw0a06.slx]
Server Address: [152.67.38.30]
This operation will reset the device
once the upgrade has been completed.
IP address format d.d.d.d
OK CANCEL

Figure A-1 Software Upgrade Utility Screen

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nands

g sections tell you how to use the Soft-
e Utility screen.

he Software Upgrade Utility acciden-
e command G to quit. If you give no
ut for 30 seconds, the utility will time

ry Defaults

nd R and then command G if you do
download a new software image.

ew Software Image

ollowing parameters:

of the Switch 2000 TR to which you
wnloading the new software image

sk (enter M).

uter (enter D). This needs to be set only
ware image file is on a server that
e accessed over a gateway or router.

of the server (enter S).

ve made any necessary parameter
s command B.

g message appears:

```
tware Upgrade
```

The utility displays a series of dots on the screen as the download proceeds. After approximately two minutes, this message appears:

```
Software Upgrade Complete
```

3 Reset the device. Refer to "After the Download"" and "Resetting the Switch 2000 TR" in Chapter 3.

Refer to "Status Messages" for more information.

After the Download

When you have successfully downloaded the new software image, the Switch 2000 TR resets automatically. After a successful download the Switch 2000 TR retains the following configuration data:

- Serial port configuration
- TCP/IP interface configuration (including IP address)
- Unit and port setup
- SNMP interface data (for example, the community string)
- User and security data (for example, user names and passwords)

This saved data allows you to manage immediately after the download.The following configuration values are reset to the factory defaults:

- Alarm Table
- Fault Log

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grade utility reports the status of
d attempt. It reports error messages
was unsuccessful.

ges are described below:

gh 7 are standard TFTP errors as
. These errors generally indicate that
ccess privileges to access the soft-
k with your system administrator.

. Check that you have entered the

on.

on.

nsfer identifier.

rom the load server. ***Check that***
ed the correct address for the
e software image file is stored
is switched on.

gh 12 indicate that the file is cor-
ve been corrupted during transmis-
e download again.

h mismatch.

11—Invalid record type.

12—Checksum error.

Message 13 and 14 indicate that you are trying to load the wrong type of software image file.

13—File is for the wrong device type.

14—File is for the wrong hardware version.

Messages 15 through 17 indicate that the file is corrupted. It may have been corrupted during transmission. Attempt the download again.

15—File header record is missing from file.

16—Byte count error.

17—Load address in file was outside memory.

Messages 18 and 19 indicate a hardware failure on the Switch 2000 TR. Consult your supplier for further advice.

18—Failed to erase Flash EPROM.

19—Flash EPROM programming failed.

Messages 20 through 22 show that system load is underway or has successfully completed.

20—System load pending.

21—System load active.

22—System load successful.

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Screen Access Rights

his appendix specifies which level of
w and usually edit (write). Access
sers to view and/or edit the Switch
00 management screens.

nts are read-and-write except where
d-only.

able

	Accessible to . . .
	Monitor Manager Security
	Monitor Manager Security
ement	Monitor Manager Security
	Monitor Manager Security
	Monitor Manager Security

Screen	Accessible to . . .
Port Statistics (Error)	Monitor Manager Security
Unit Traffic	Monitor Manager Security
Switch Database View	Monitor Manager Security
Unit Setup	Monitor *read-only* Manager Security
Port Setup	Monitor *read-only* Manager Security
Remote Poll	Manager Security
Security Menu	Monitor Manager Security
Create User	Security
Delete User	Security
Local Security	Security
Change User	Monitor Manager Security

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	Accessible to . . .
	Monitor Manager Security
	Monitor Manager Security
	Monitor *read-only* Manager Security
	Monitor *read-only* Manager Security
	Monitor *read-only* Manager Security
	Security
	Security
	Manager
	Security

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Serial Port Cable Pin-outs

ble

32 25 pin. Pin numbers that are under-
erent. All other pin designations are
gh.

Serial Cable Pin Outs

	DB9 Female
	1
	3
	2
	4
	5
	6
	7
	8
	9

dule Options

n ATM, FDDI, or TR-in-FE module, see
manuals for special cabling specifica-

- SuperStack II Switch 2000 TR ATM OC-3 Module User Guide (Part Number #99041)
- SuperStack II Switch 2000 TR FDDI Module User Guide (Part Number #99048)
- SuperStack II Switch 2000 TR TR-in-FE Module User Guide (Part Number #99045)

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L PORT CABLE PIN-OUTS

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TROUBLESHOOTING

g Procedures

x lists potential problems you might naging the Switch 2000 TR and ested actions to take. If you experience ot listed here or that you cannot solve, ct your local technical support represen-

Main Banner screen does not dis-

our terminal or terminal emulator is figured to operate as a VT100 terminal.

t access, try pressing [Return] several the Main Banner appears.

ttings on your terminal or emulator.

ting Up the VT100 Console" in

incorrectly displayed:

our terminal or terminal emulator is figured to operate as a VT100 terminal.

ttings on your terminal or emulator.

ting Up the VT100 Console" in

The SNMP manager cannot access the device:

Check that the device's IP address, subnet mask, and default router are correctly configured, and that the device has been reset. Check that the device's IP address is correctly recorded by the SNMP manager.

Refer to "Setting Up the VT100 Console" in Chapter 3.

The Telnet workstation cannot access the device:

Check that the device's IP address, subnet mask and default router are correctly configured, and that the device has been reset.

Be sure that you enter the IP address correctly when invoking the Telnet facility.

Refer to "Setting Up the VT100 Console" in Chapter 3.

Traps are not received by the SNMP manager:

Check that the SNMP manager's IP address and the community string are correctly configured.

Refer to "Setting Up the VT100 Console" in Chapter 3.

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ager or Telnet workstation can s the device:

te Telnet access or Commu- is enabled.

ort through which you are access- s not been disabled, see "Port Chapter 4. If it is enabled, check nd network cabling at the port.

device through a different port. If ess the device, a problem with the dicated. Re-examine the connec-

m can prevent you from accessing he network. Try accessing the e serial port. Refer to "Setting Up le" in Chapter 3.

password and cannot log in:

e of the default users (monitor, ity), another user having security og in, delete your user name, and r name for you, with a new pass-

ing 'security' access level can log in device. This action returns all con- ation, including passwords, to the lues.

ows a password for a security t your supplier.

If Power LED is Yellow. . .

Unit failed self-test. Return to supplier.

If port fails to join ring . . .

Check ring speed and cable. Check personality of port.

If server fails to attach to ports 1 through 4. . .

Check personality and cable connection.

If Source Route traffic is not forwarded...

Check Bridge Type, Ring Number initialized and matches other bridges on ring. Make sure ring/bridge/ring numbers are unique.

Broadcast storms. . .

Check to see if Spanning Tree is enabled. If yes, make sure the type and address match the rest of the network.

If Transparent traffic not forwarded. . .

Check Bridge Type and verify if it is Source Route Transparent or Transparent.

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SWITCH 2000 TR
TECHNICAL SPECIFICATIONS

ns	Height: 2.75 inches (7.0 cm) x Width: 17.25 inches (44cm) x Depth 12 inches (30.5 cm) Weight: 4.4kg (9.7lbs)
rements	
ıre	32˚ to 120˚F (0˚ to 50˚ C)
	10 to 95% relative humidity, non-condensing
	UL 1950, EN60950 (TUV), CSA 22.2 No. 950
	5A Time Delay Fuse
sions	EN55022 Class A, FCC Part 15 Class A
)	EN50082-1 (IEC801 Parts 2-5)
	100 watts maximum (341 BTU/hour maximum)
	50/60 Hz
s	100-120/200-240 VAC
	100 VAC at 3 amps (maximum)/200 VAC at 2 amps (maximum)

SNMP

- SNMP protocol (RFC 1157)
- MIB-II (RFC 1213)
- Bridge MIB (RFC 1493)
- Source Route Bridge MIB (RFC 1525)
- RMON MIB (RFC 1271)
- Token Ring Extension to RMON MIB (RFC 1513)
- BootP (RFC 951)

Terminal Emulation

- telnet (RFC 854)

Protocols Used for Administration

- UDP (RFC 768)
- IP (RFC 791)
- ICMP (RFC 792)
- TCP (RFC 793)
- ARP (RFC 826)
- TFTP (RFC 783)

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Module Options

TM, FDDI, or TR-in-FE module, see
nuals for technical specifications:

witch 2000 TR ATM OC-3 Module
rt Number #99041)

witch 2000 TR FDDI Module User
mber #99048)

witch 2000 TR TR-in-FE Module
rt Number #99045)

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TECHNICAL SUPPORT

es easy access to technical support infor-
gh a variety of services. This appendix
se services.

ontained in this appendix is correct at
cation. For the very latest, we recom-
u access 3Com Corporation's World
e.

l Services

worldwide product support 24 hours a
week, through the following online

le Web site

etin Board Service (3ComBBS)

s[SM] automated fax service

m on CompuServe online service

Site

test networking information on 3Com
World Wide Web site by entering our
Internet browser:

com.com/

eatures the latest information about
ns and technologies, customer service
and support, news about the company, *Net Age*® Magazine, and more.

3Com Bulletin Board Service

3ComBBS contains patches, software, and drivers for all 3Com products, as well as technical articles. This service is available through analog modem or digital modem (ISDN) 24 hours a day, 7 days a week.

Access by Analog Modem

To reach the service by modem, set your modem to 8 data bits, no parity, and 1 stop bit. Call the telephone number nearest you:

Country	Data Rate	Telephone Number
Australia	up to 14400 bps	61 2 9955 2073
Brazil	up to 14400 bps	55 11 547 9666
France	up to 14400 bps	33 1 6986 6954
Germany	up to 28800 bps	4989 62732 188
Hong Kong	up to 14400 bps	852 2537 5608
Italy (fee required)	up to 14400 bps	39 2 27300680
Japan	up to 14400 bps	81 3 3345 7266
Mexico	up to 28800 bps	52 5 520 7853
P.R. of China	up to 14400 bps	86 10 684 92351
Singapore	up to 14400 bps	65 534 5693

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Rate	Telephone Number
14400 bps	886 2 377 5840
28800 bps	44 1442 438278
28800 bps	1 408 980 8204

l Modem

al in to 3ComBBS using a digital
ccess up to 56 Kbps. To access
SDN, use one of the following

408 654 2703

d Fax Service

n's interactive fax service,
des data sheets, technical articles,
ubleshooting instructions on 3Com
s a day, 7 days a week.

sing your Touch-Tone telephone
e international access numbers:

elephone Number
4 1442 438279
408 727 7021

Local access numbers are available within the following countries:

Country	Telephone Number
Australia	1800 678 515
Belgium	0800 71279
Denmark	800 17319
Finland	98 001 4444
France	05 90 81 58
Germany	0130 81 80 63
Hong Kong	800 933 486
Italy	1678 99085
Malaysia	1800 801 777
Netherlands	06 0228049
New Zealand	0800 446 398
Norway	800 11062
Portugal	0505 442 607
Russia (Moscow only)	956 0815
Singapore	800 6161 463
Spain	900 964 445
Sweden	020 792954
U.K.	0800 626403

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ompuServe Online Service

contains patches, software, drivers, and
cles about all 3Com products, as well as
section for peer support. To use
you need a CompuServe account.

Forum:

ur CompuServe account.

ecom

to see the 3ComForum main menu.

our Network Supplier

ssistance is required, contact your
lier. Many suppliers are authorized
partners who are qualified to provide a
vices, including network planning, instal-
are maintenance, application training,
services.

ntact your network supplier for assis-
he following information ready:

stem hardware and software, including
vels

error messages

out recent configuration changes, if

ble to contact your network supplier,
ving section on how to contact 3Com.

Support from 3Com

If you are unable to receive support from your network supplier, technical support contracts are available from 3Com.

Contact your local 3Com sales office to find your authorized service provider using one of these numbers:

Regional Sales Office	Telephone Number
3Com Corporation	
P.O. Box 58145 5400 Bayfront Plaza Santa Clara, California 95052-8145 U.S.A.	800 NET 3Com *or* 1 408 764 5000 408 764 5001 (fax)
3Com Asia Limited	
Australia	61 2 9937 5000 (Sydney) 61 3 9866 8022 (Melbourne)
Hong Kong	852 2501 1111
India	91 11 644 3974
Indonesia	62 21 572 2088
Japan	81 6 536 3303 (Osaka) 81 3 3345 7251 (Tokyo)
Korea	82 2 319 4711
Malaysia	60 3 732 7910
New Zealand	64 9 366 9138
Philippines	632 892 4476
P.R. of China	8610 68492568 (Beijing) 86 21 63501581 (Shanghai)
Singapore	65 538 9368
Taiwan, R.O.C.	886 2 377 5850
Thailand	662 231 8151 5
3Com Benelux B.V.	
Belgium	32 2 725 0202
Netherlands	31 30 6029700

(continued)

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	Telephone Number
	403 265 3266
	403 423 3266
	514 683 3266
	1 613 566 7055
	416 498 3266
	604 434 3266
	33 1 69 86 68 00
	43 1 513 4323
olic	420 2 21845 800
	49 30 34 98790 (Berlin)
	49 89 627320 (Munich)
	36 1 250 83 41
	48 22 6451351
	41 31 996 14 14
	351 1 3404501
	34 1 383 17 00
	353 1 820 7077
	408 326 2093
	305 261 3266 (Miami, Florida)
	541 312 3266
	55 11 5181 0869
	562 633 8935
	571 629 4110
	52 5 520 7841/7847
	51 1 221 5399
	58 2 953 8122
	39 2 253011 (Milan)
	39 6 5279941 (Rome)
	971 4 349049

Regional Sales Office	Telephone Number
3Com Nordic AB	
Denmark	45 39 27 85 00
Finland	358 0 435 420 67
Norway	47 22 58 47 00
Sweden	46 8 632 56 00
3Com Russia	007 095 258 09 40
3Com Southern Africa	27 11 807 4397
3Com UK Ltd.	44 131 240 2900 (Edinburgh) 44 161 873 7717 (Manchester) 44 162 889 7000 (Marlow)

Returning Products for Repair

Before you send a product directly to 3Com for repair, you must first obtain a Return Materials Authorization (RMA) number. Products sent to 3Com without RMA numbers will be returned to the sender unopened, at the sender's expense.

To obtain an RMA number, call or fax:

Country	Telephone Number	Fax Number
U.S.A. and Canada	1 800 876 3266, option 2	408 764 7120
Latin America	1 408 326 2927	408 764 7120
Europe, South Africa, and Middle East	44 1442 438125	44 1442 435822
Elsewhere	1 408 326 2926	1 408 764 7120

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